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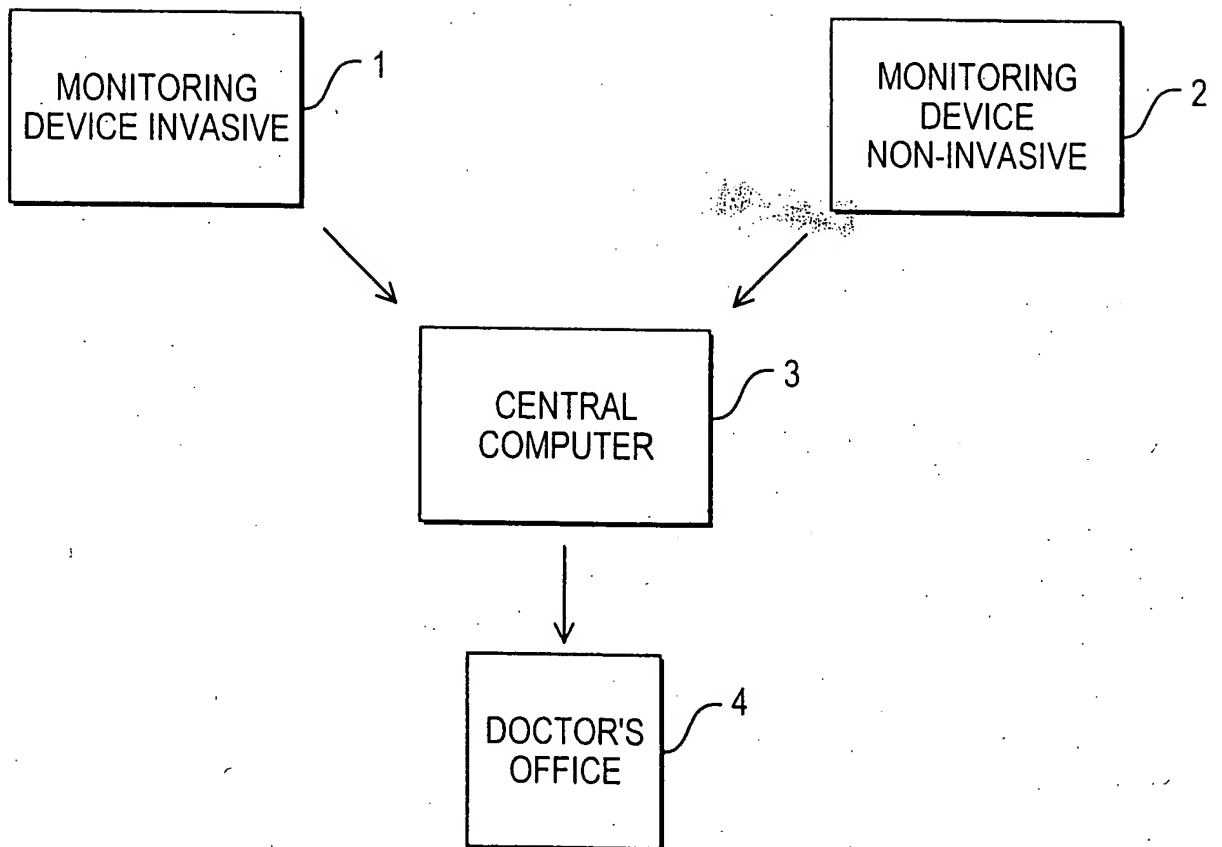
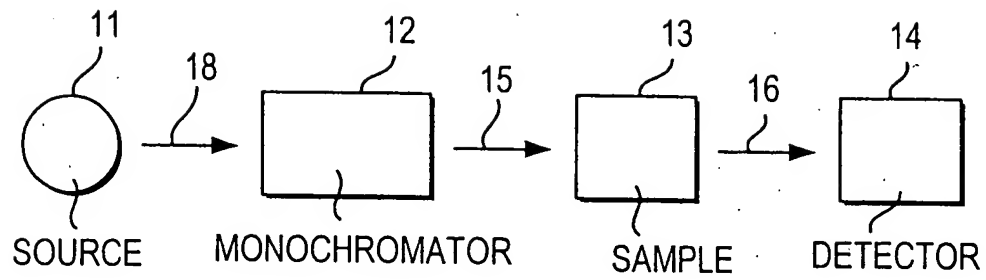
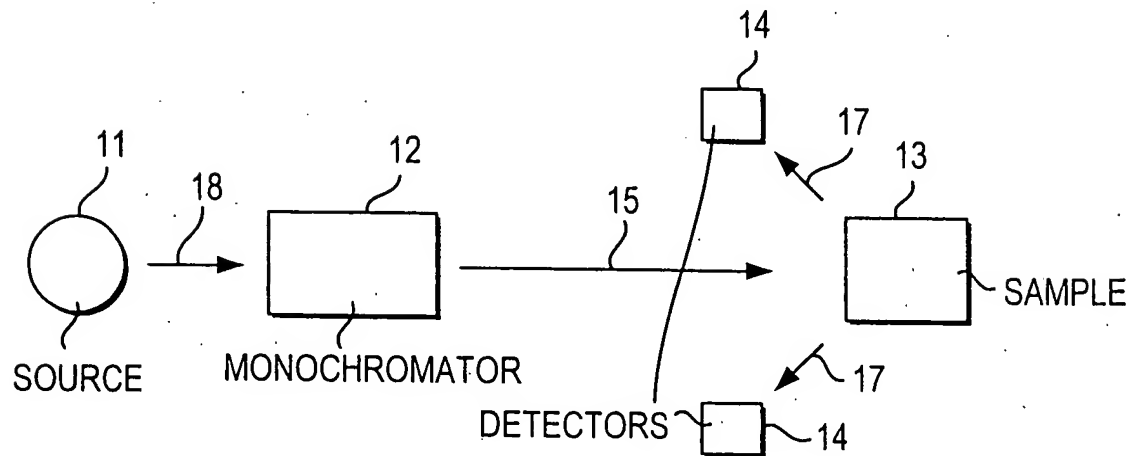


FIG. 1



NEAR-INFRARED TRANSMITTANCE (NIT)

*FIG. 2(A)*

NEAR-INFRARED REFLECTANCE (NIR)

*FIG. 2(B)*

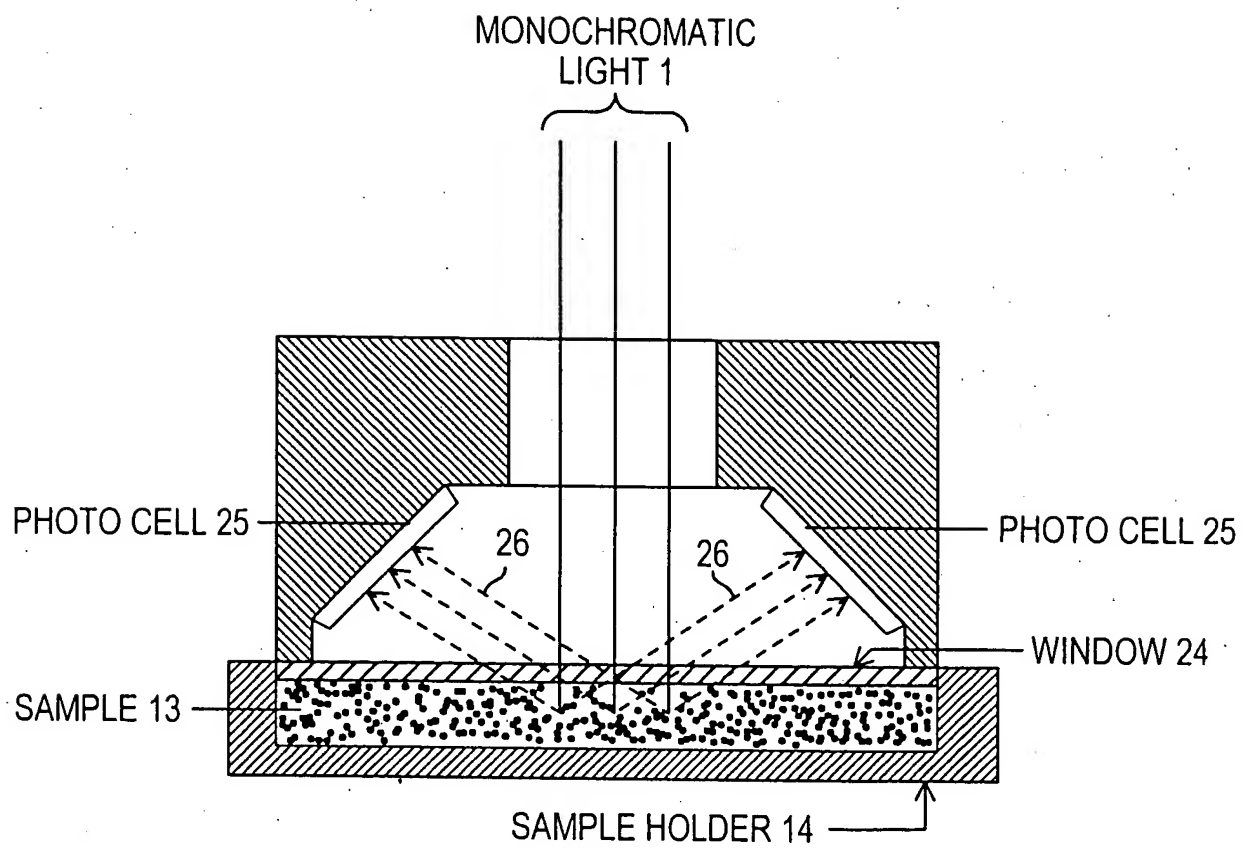
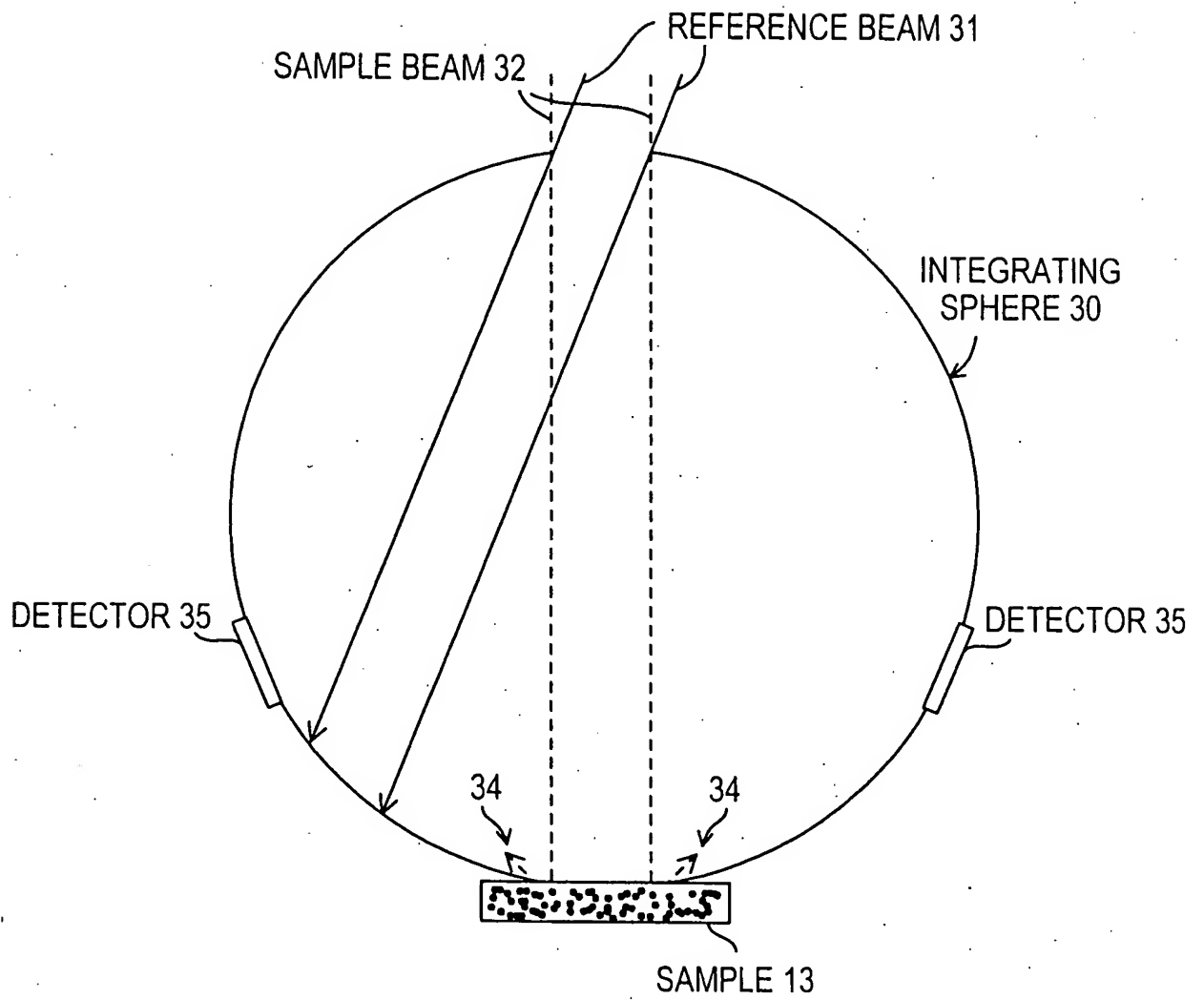
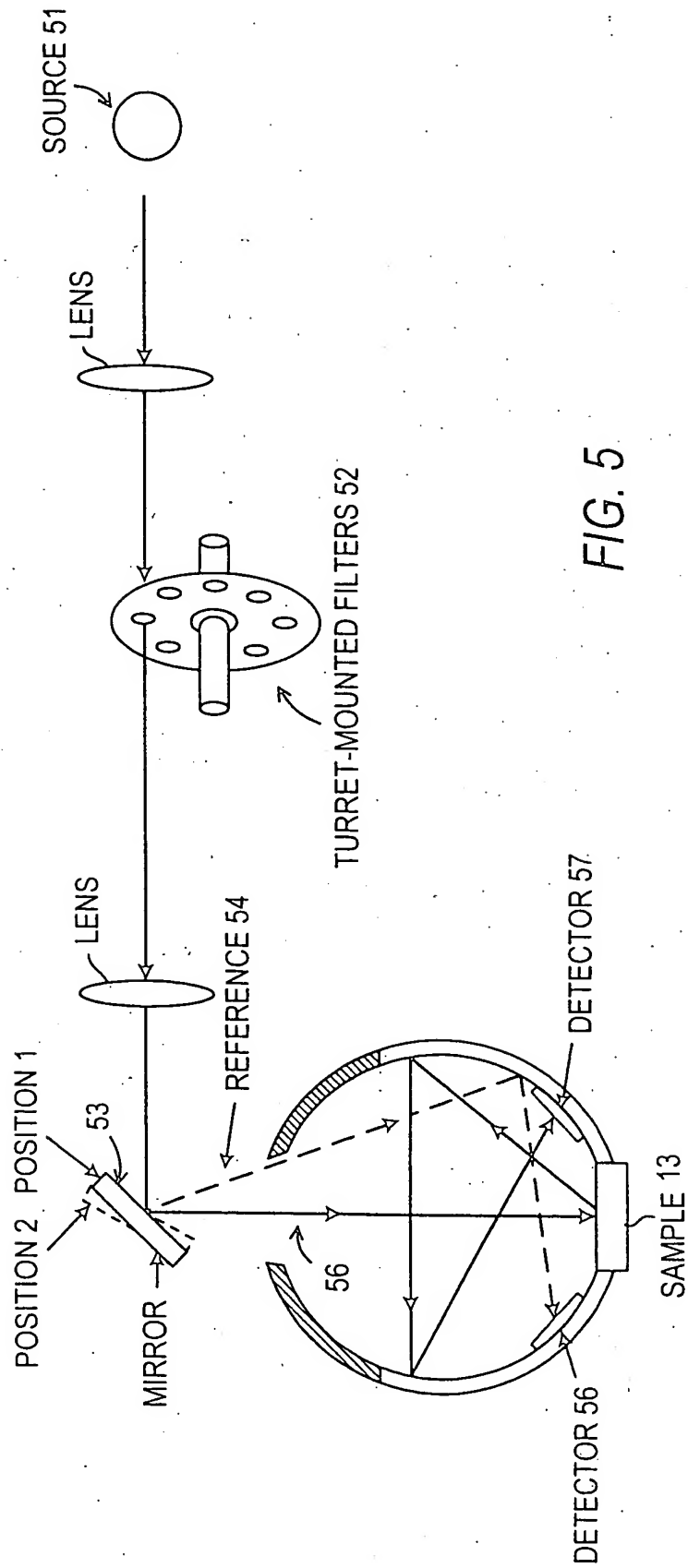
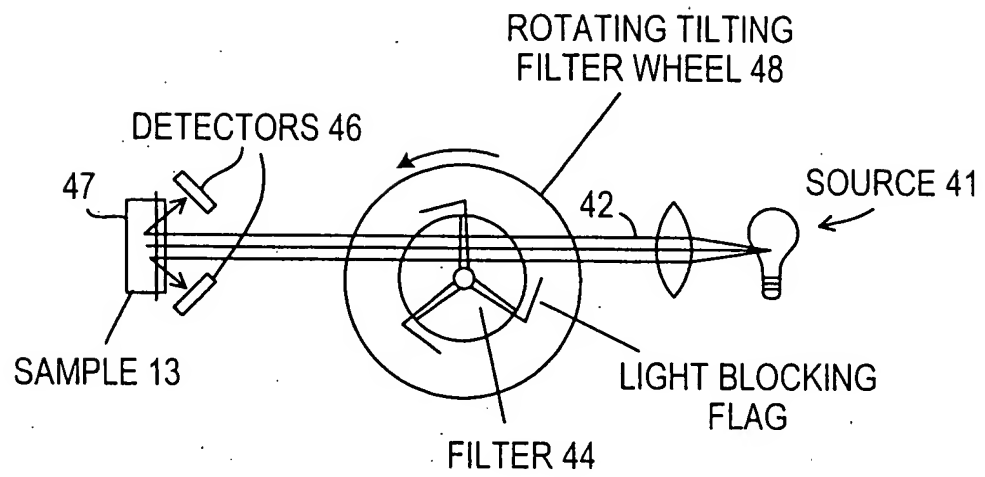


FIG. 3

**FIG. 4**



**FIG. 6**

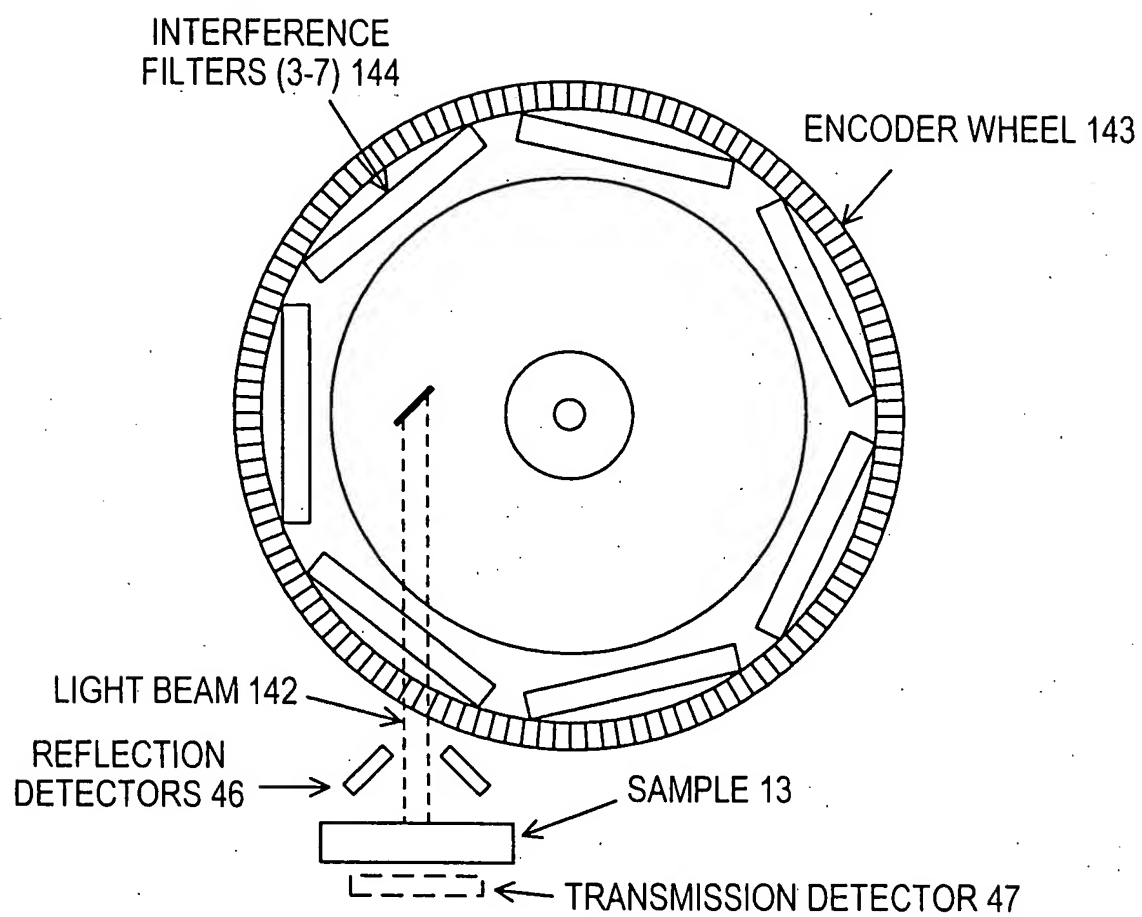


FIG. 7



FIG. 8(A)

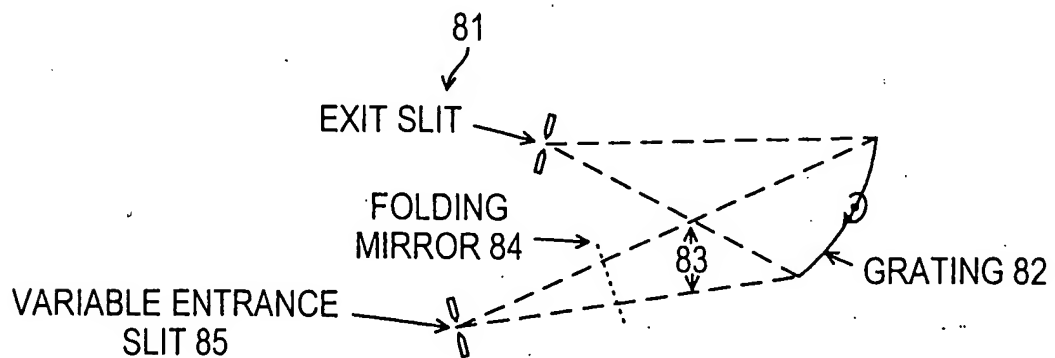
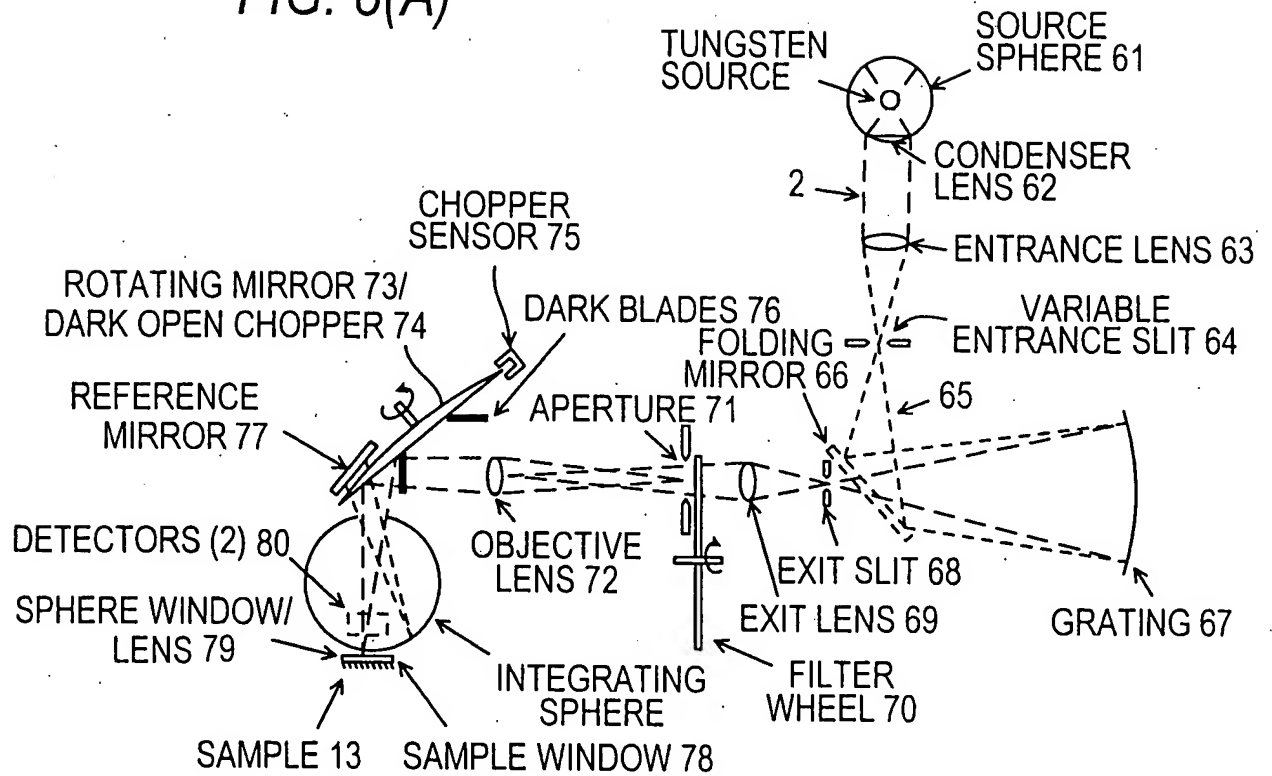


FIG. 8(B)

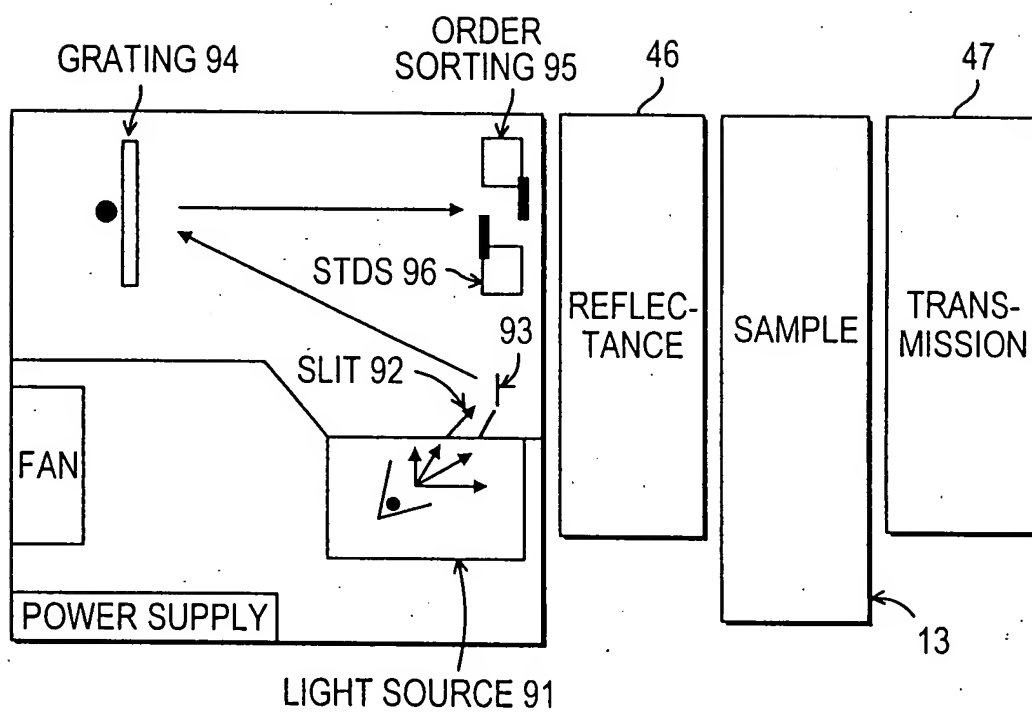


FIG. 9

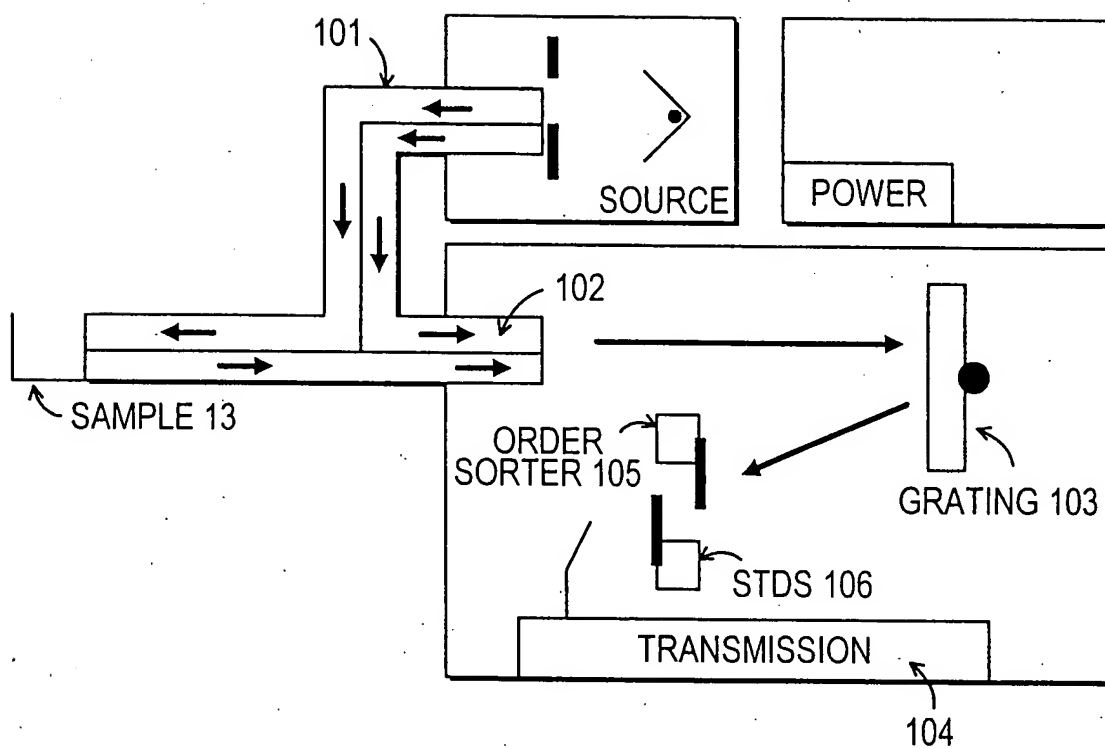


FIG. 10

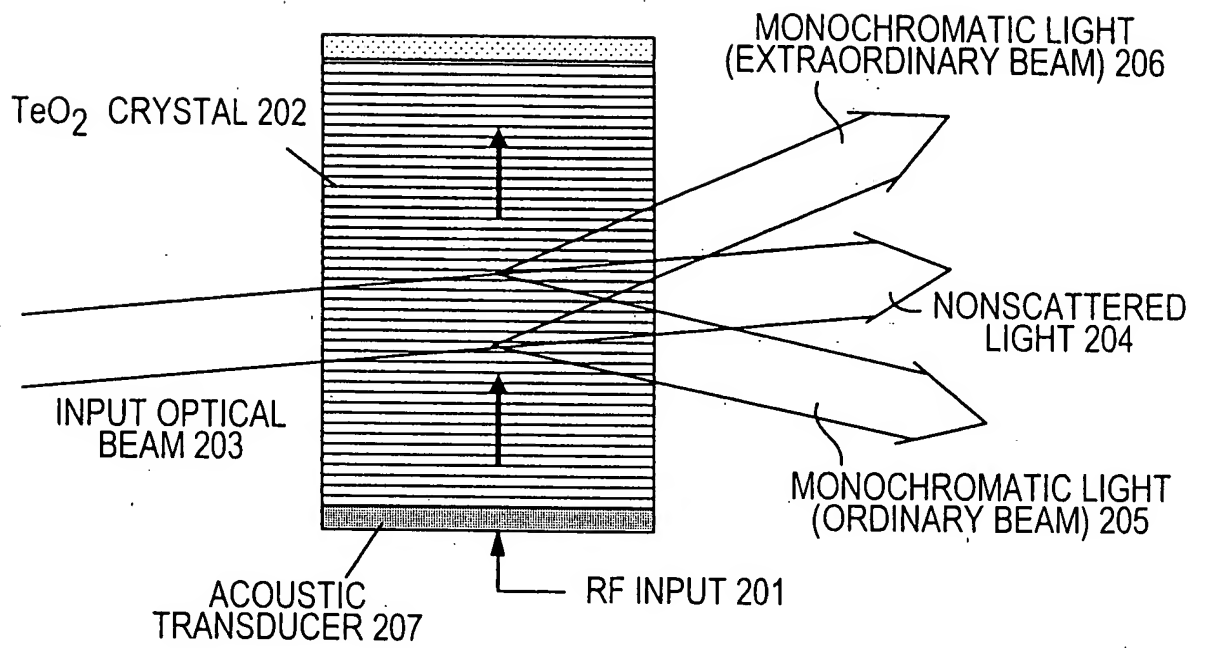


FIG. 11

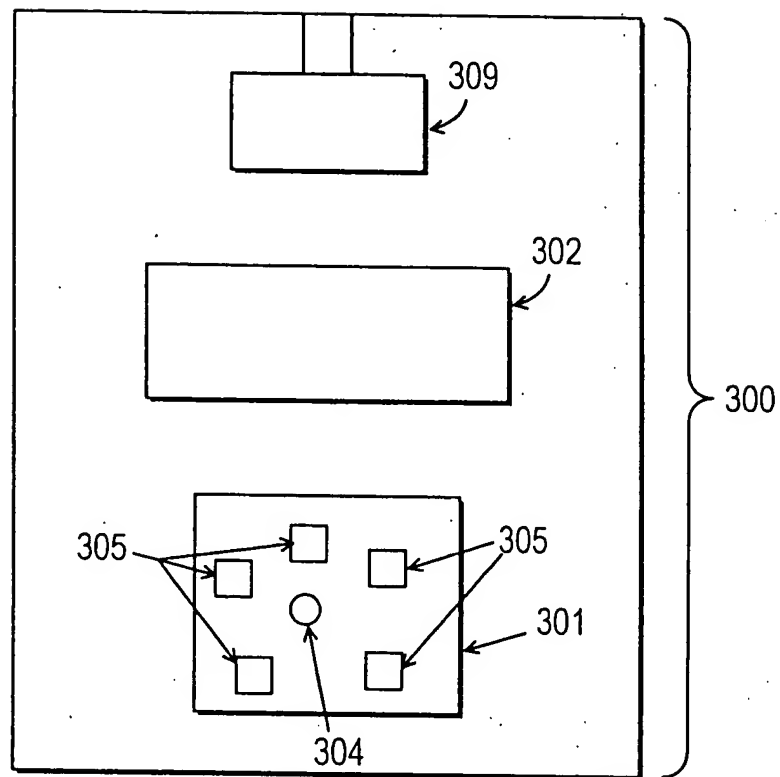


FIG. 12(A)

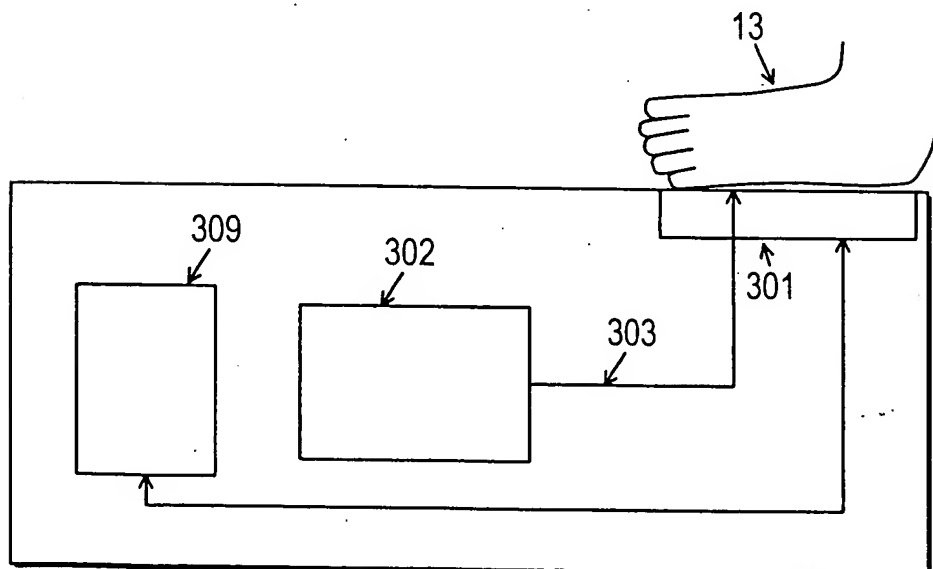
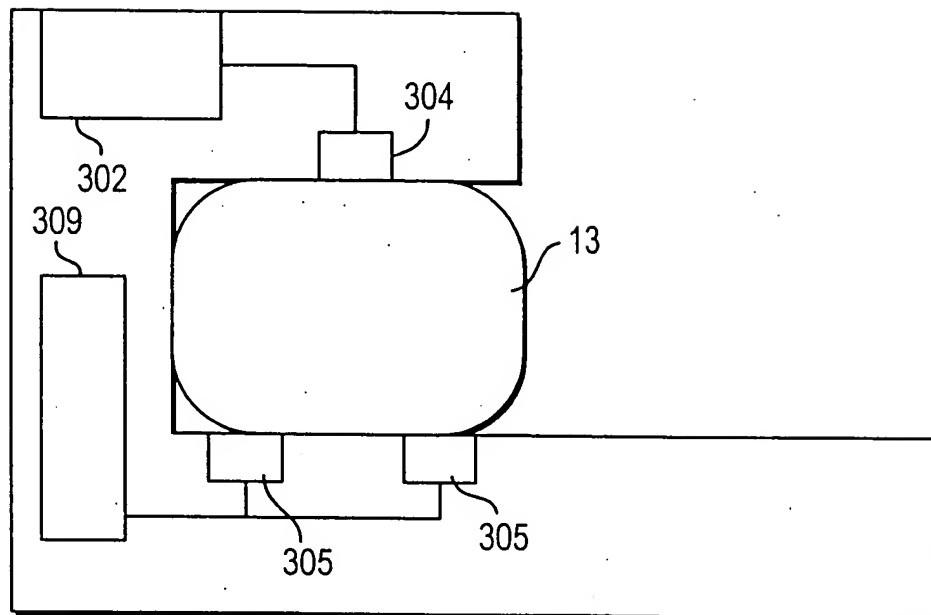


FIG. 12(B)

*FIG. 12C*

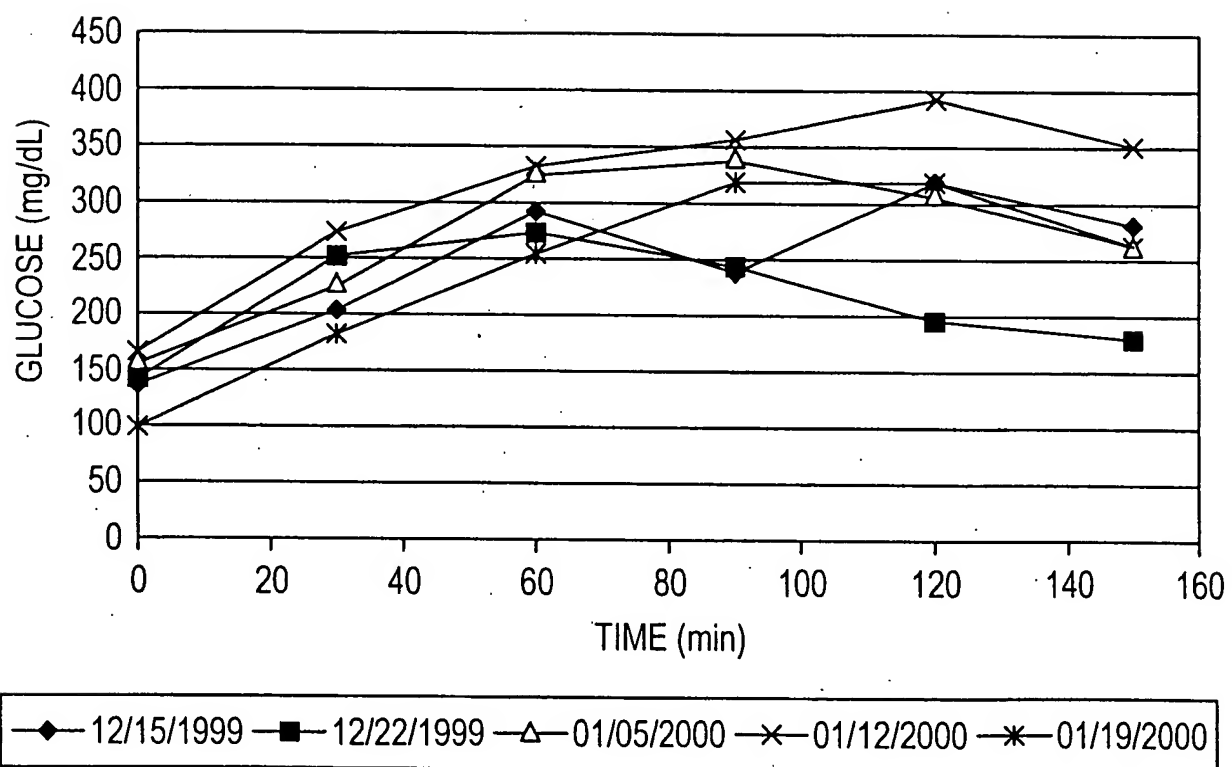
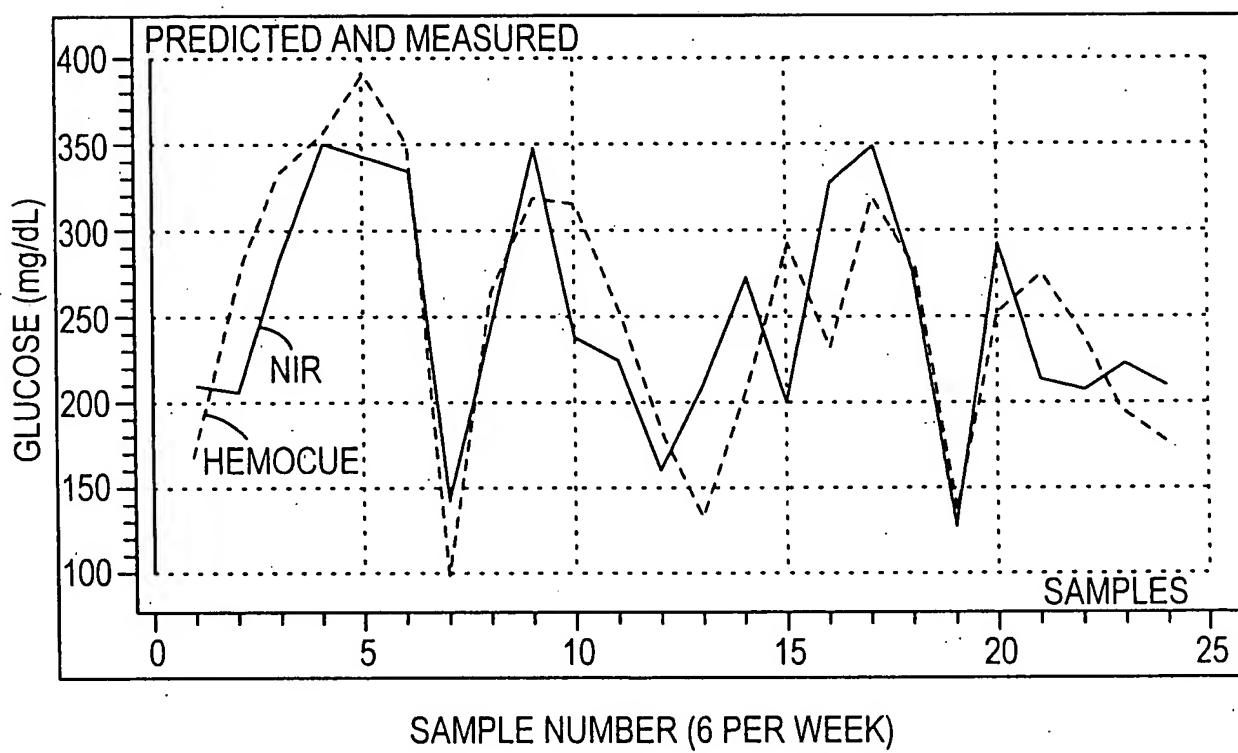


FIG. 13A

*FIG. 13B*



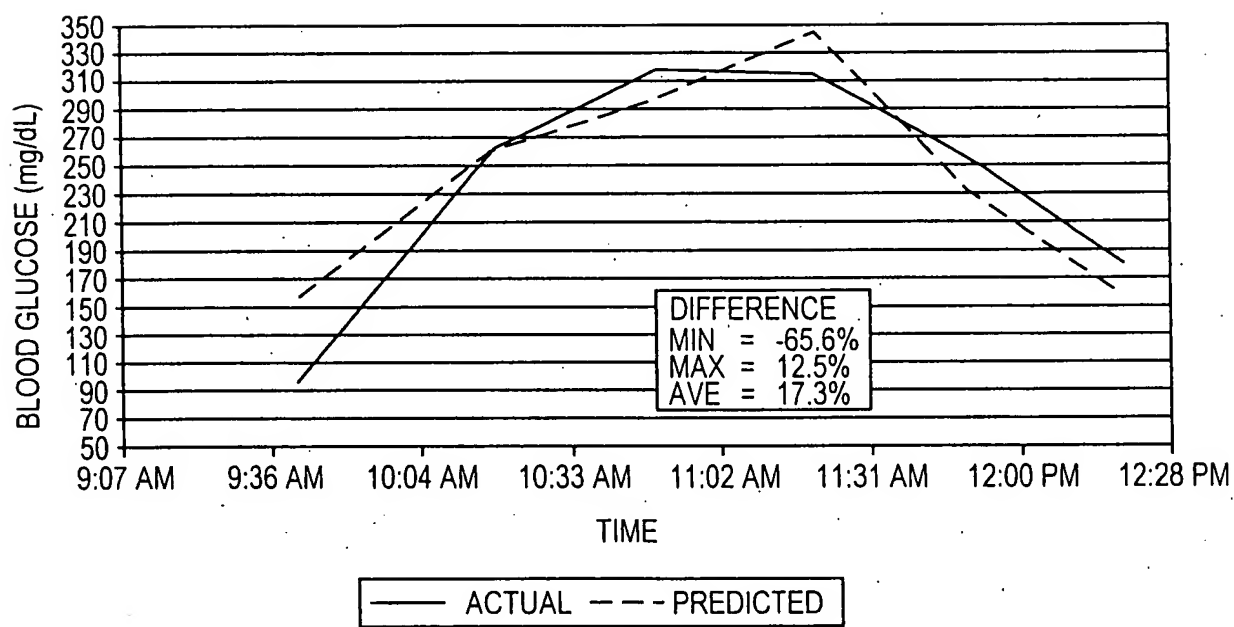


FIG. 13C

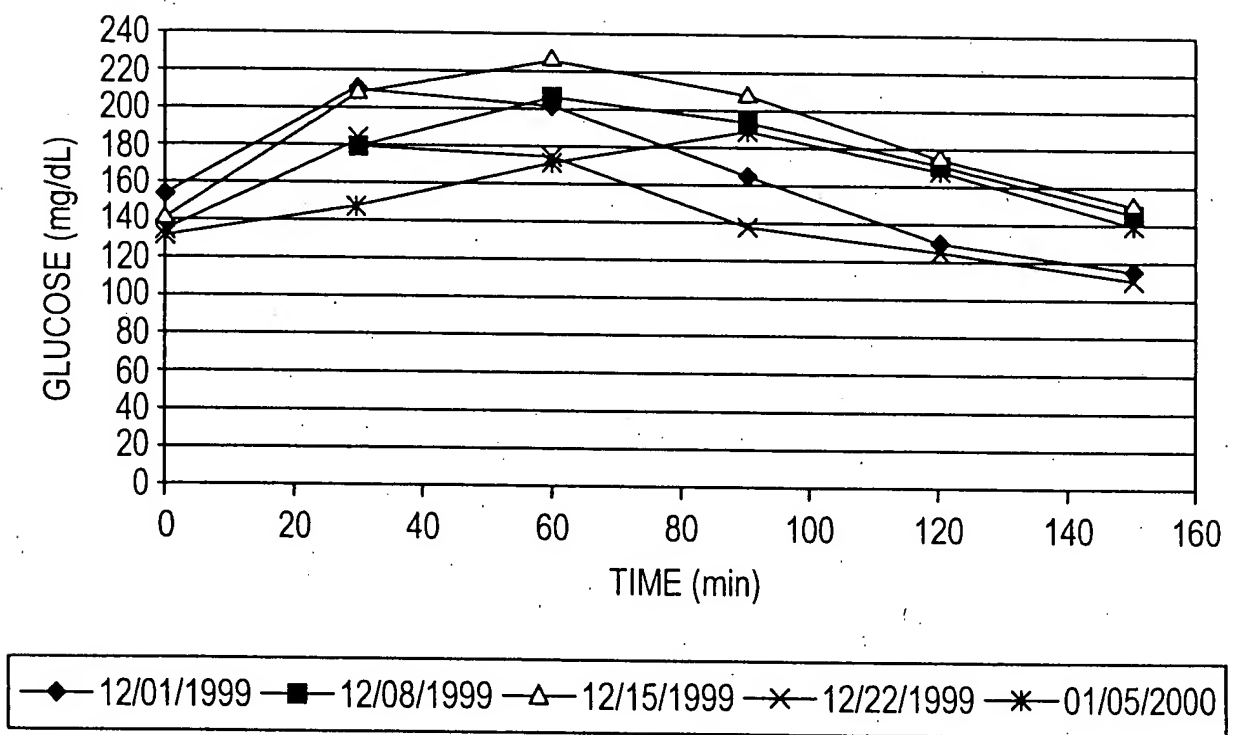


FIG. 14A

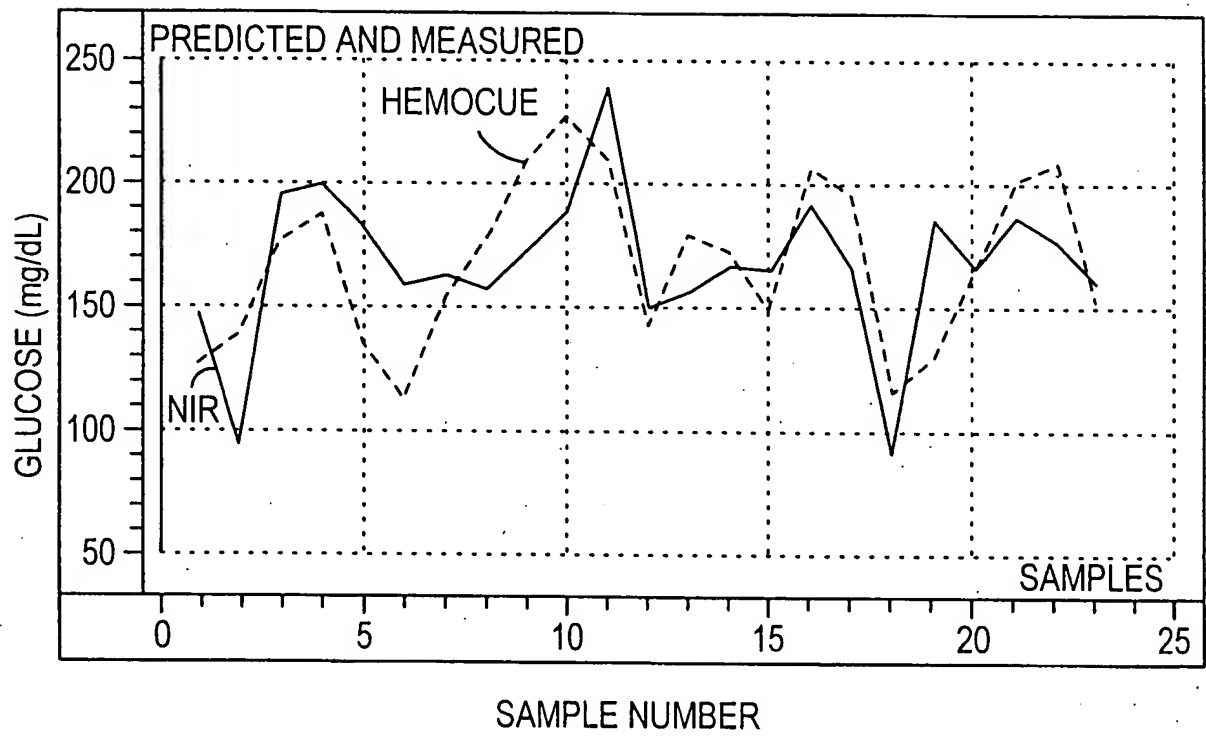


FIG. 14B

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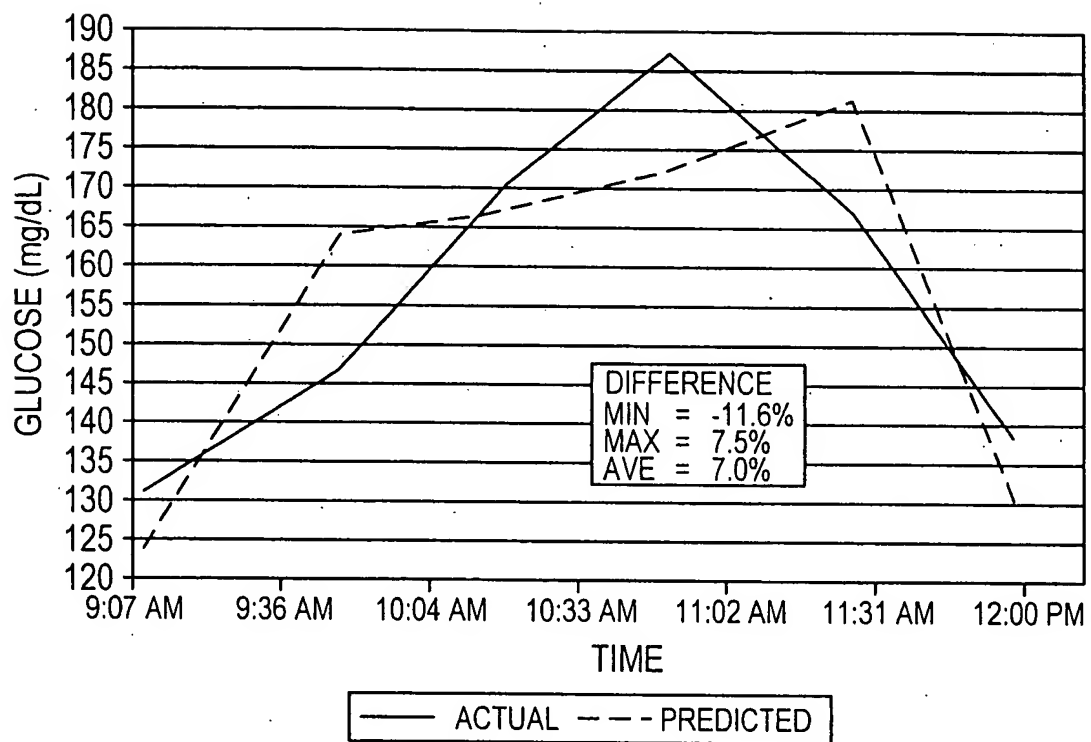


FIG. 14C

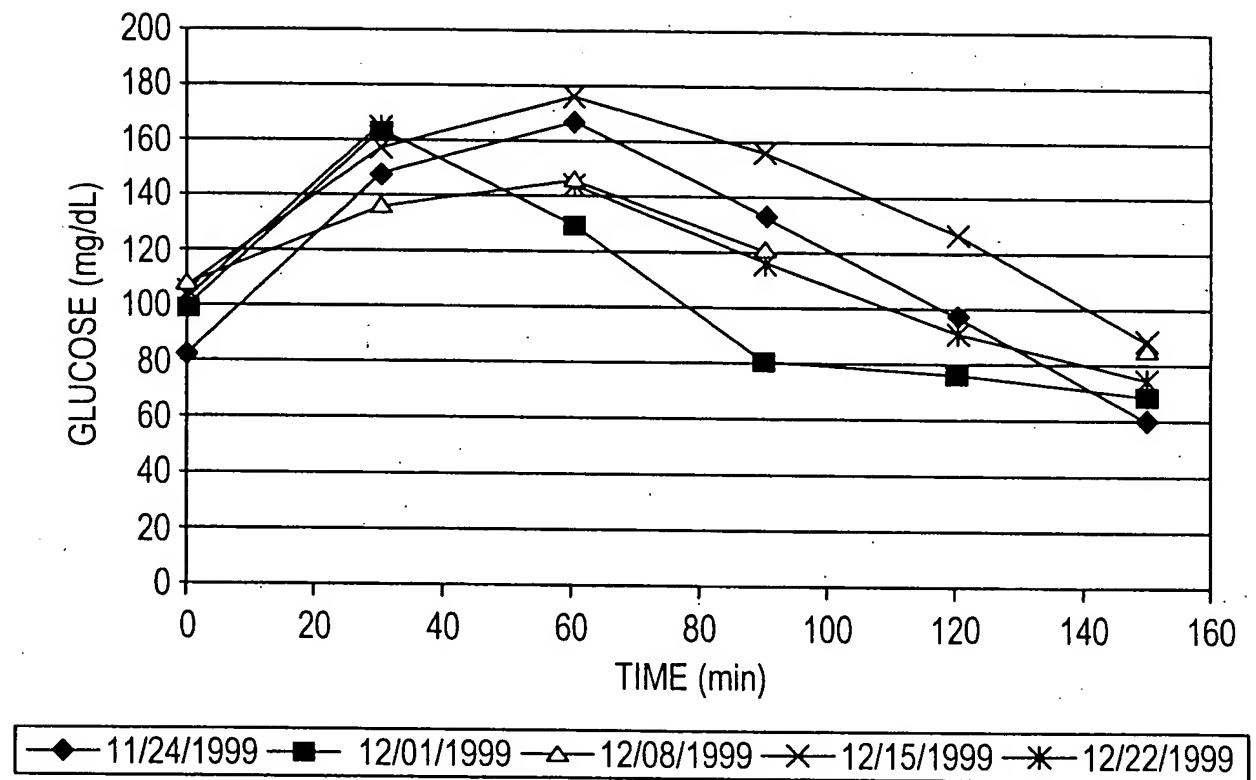
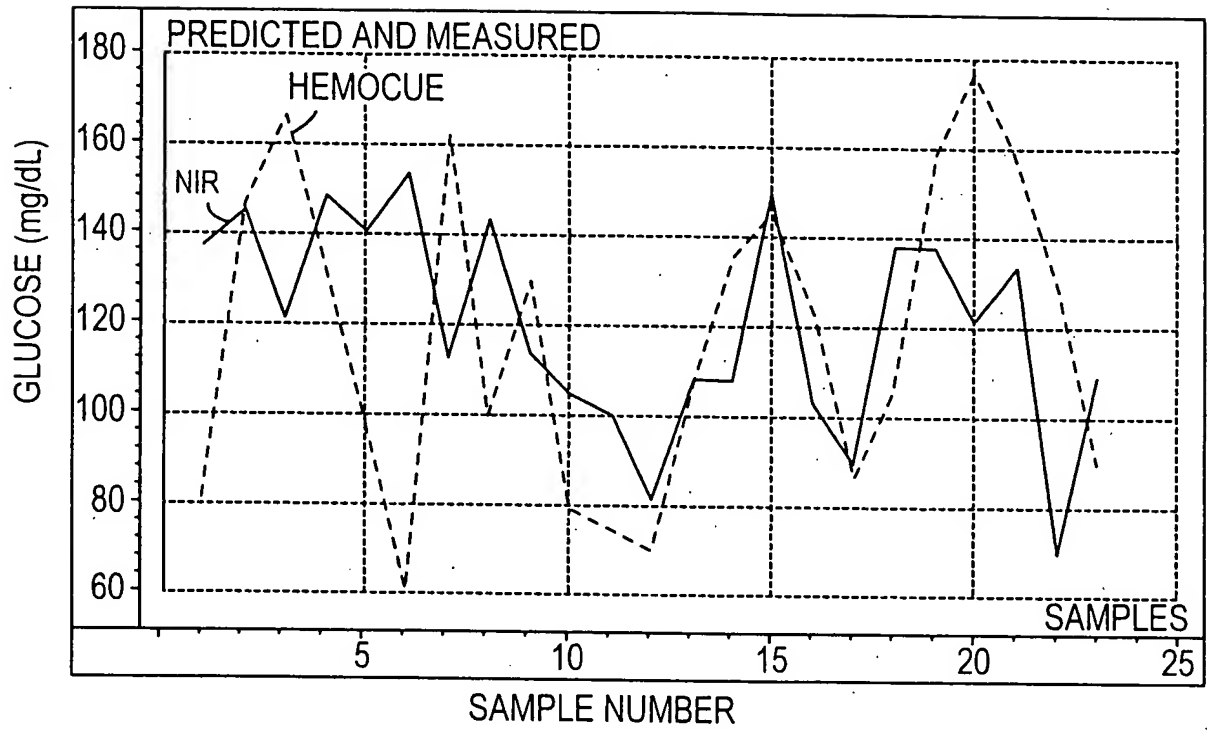


FIG. 15A

*FIG. 15B*

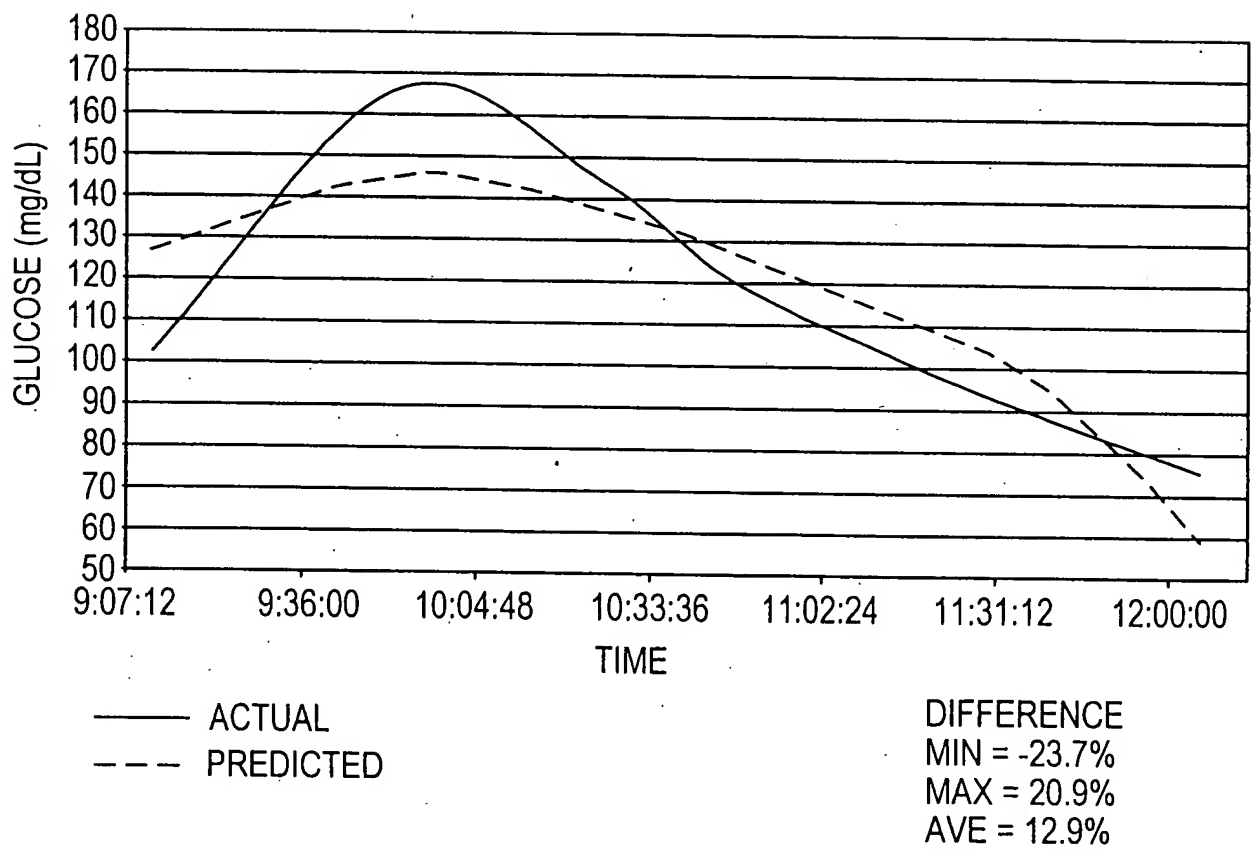


FIG. 15C

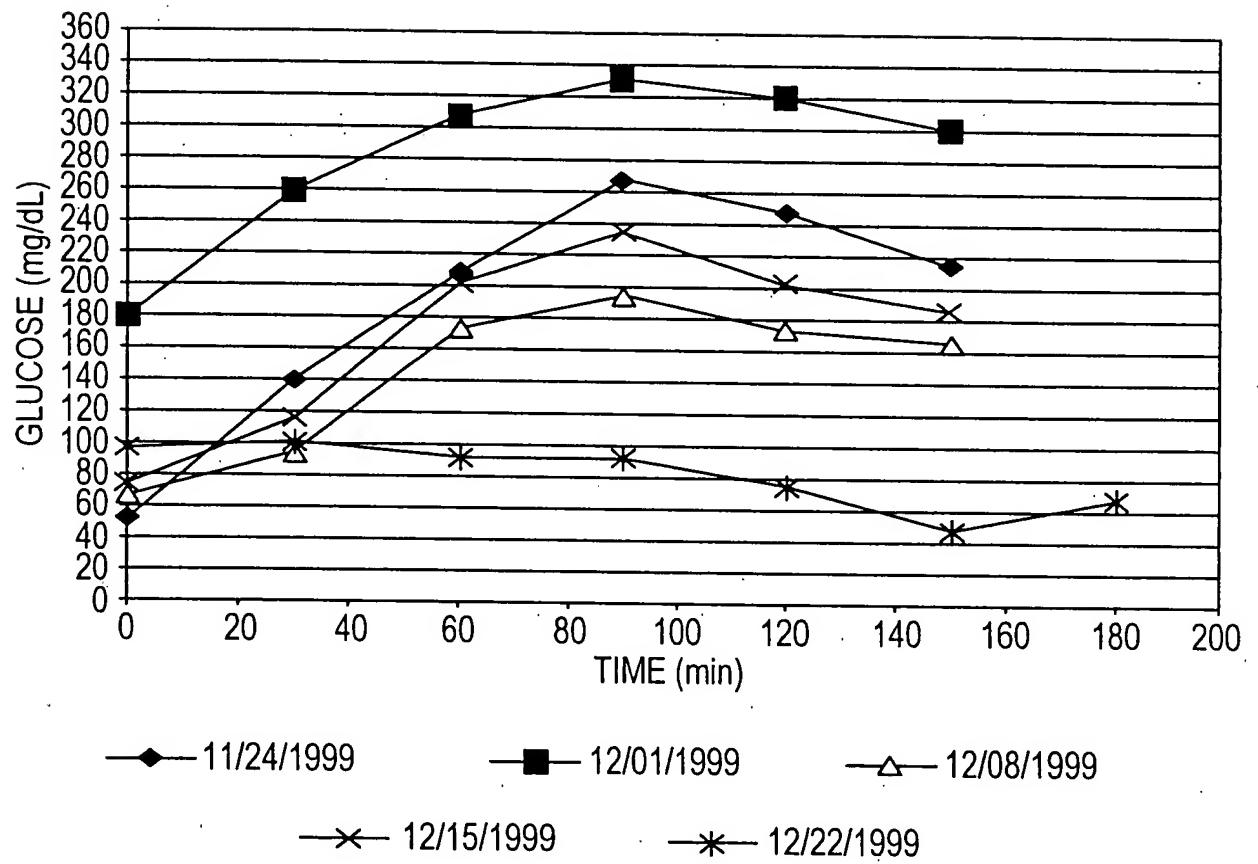


FIG. 16A



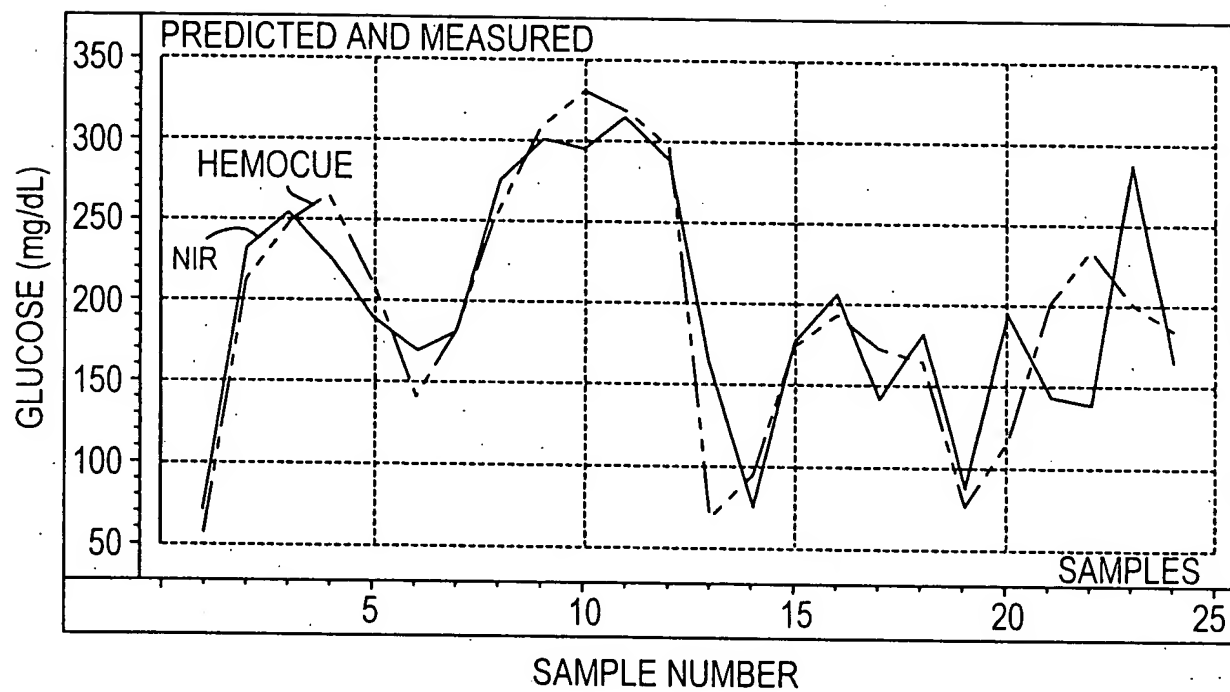
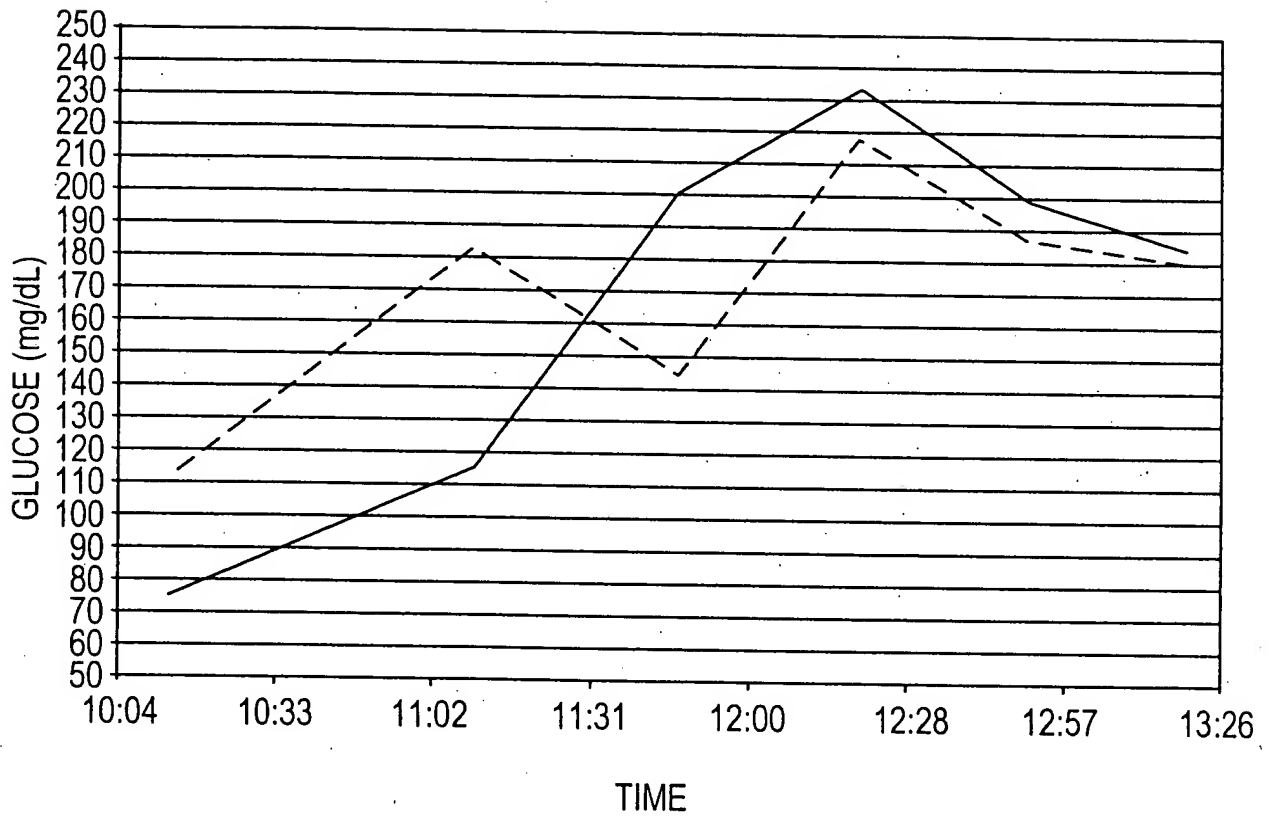


FIG. 16B



— ACTUAL  
--- PREDICTED

DIFFERENCE  
MIN = -58.1%  
MAX = 27.9%  
AVE = 24.9%

FIG. 16C

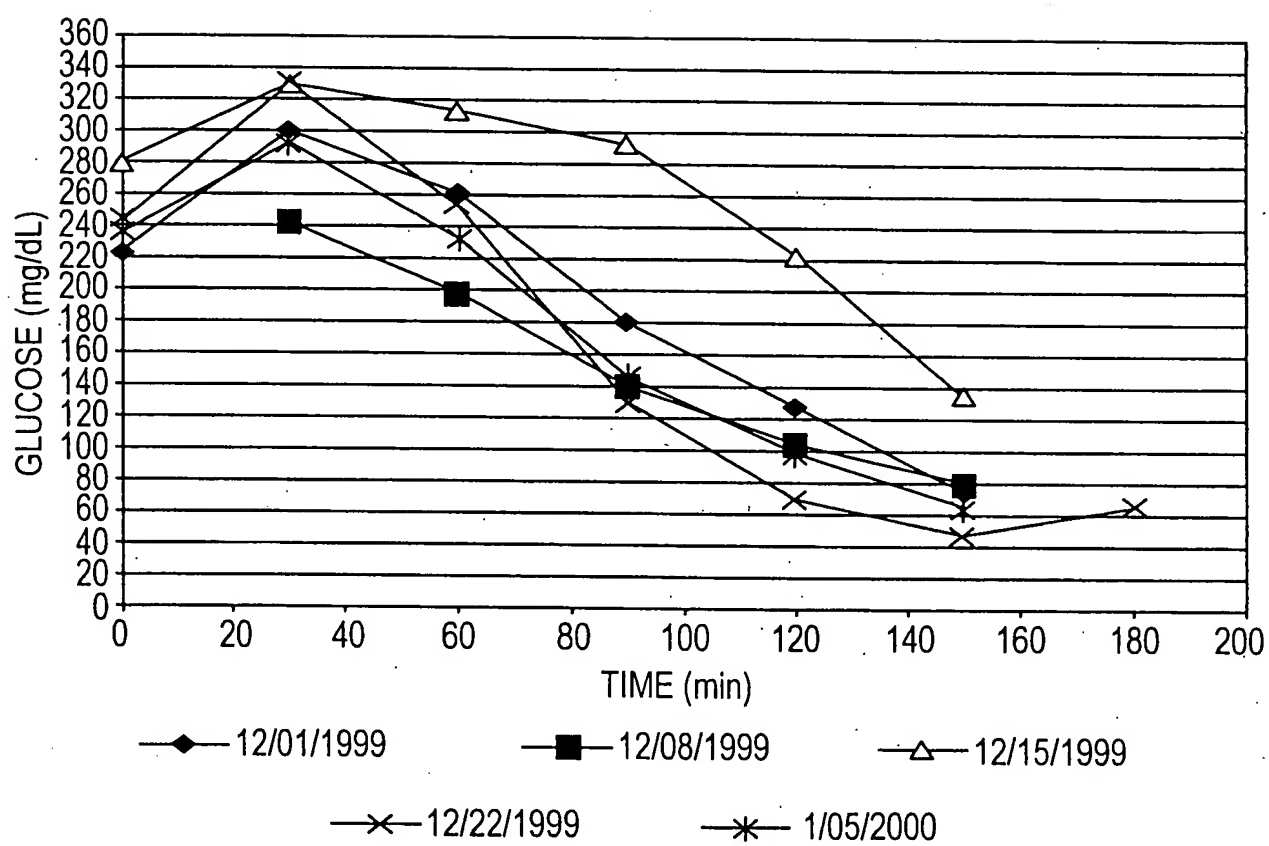


FIG. 17A

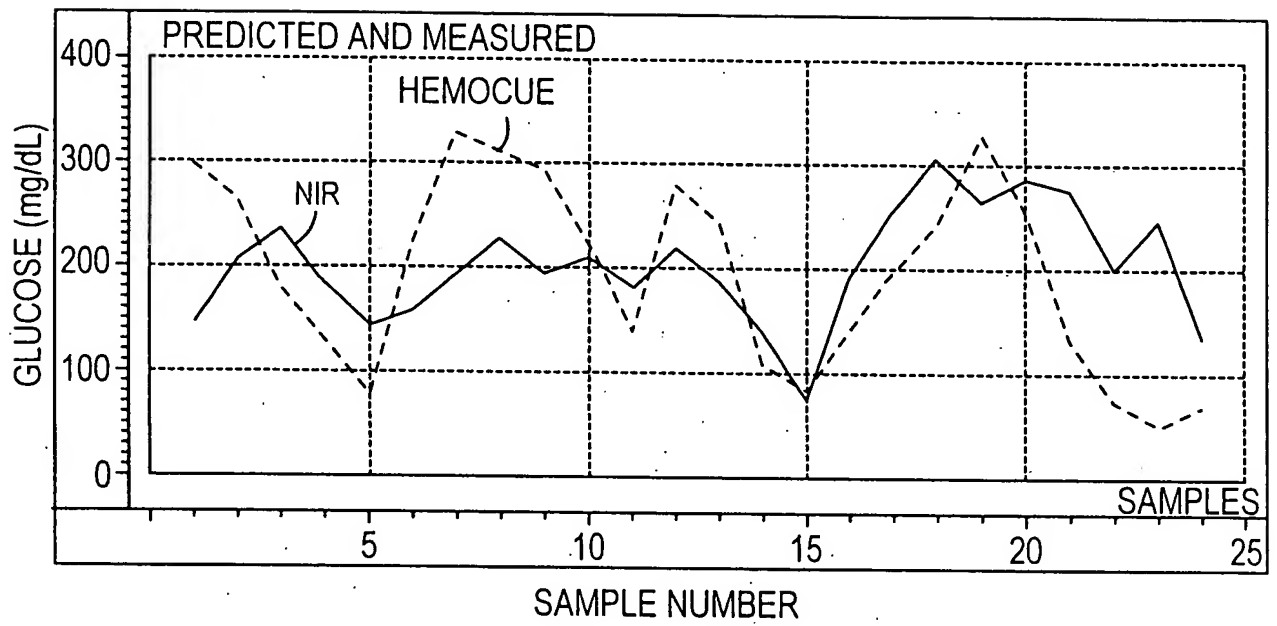
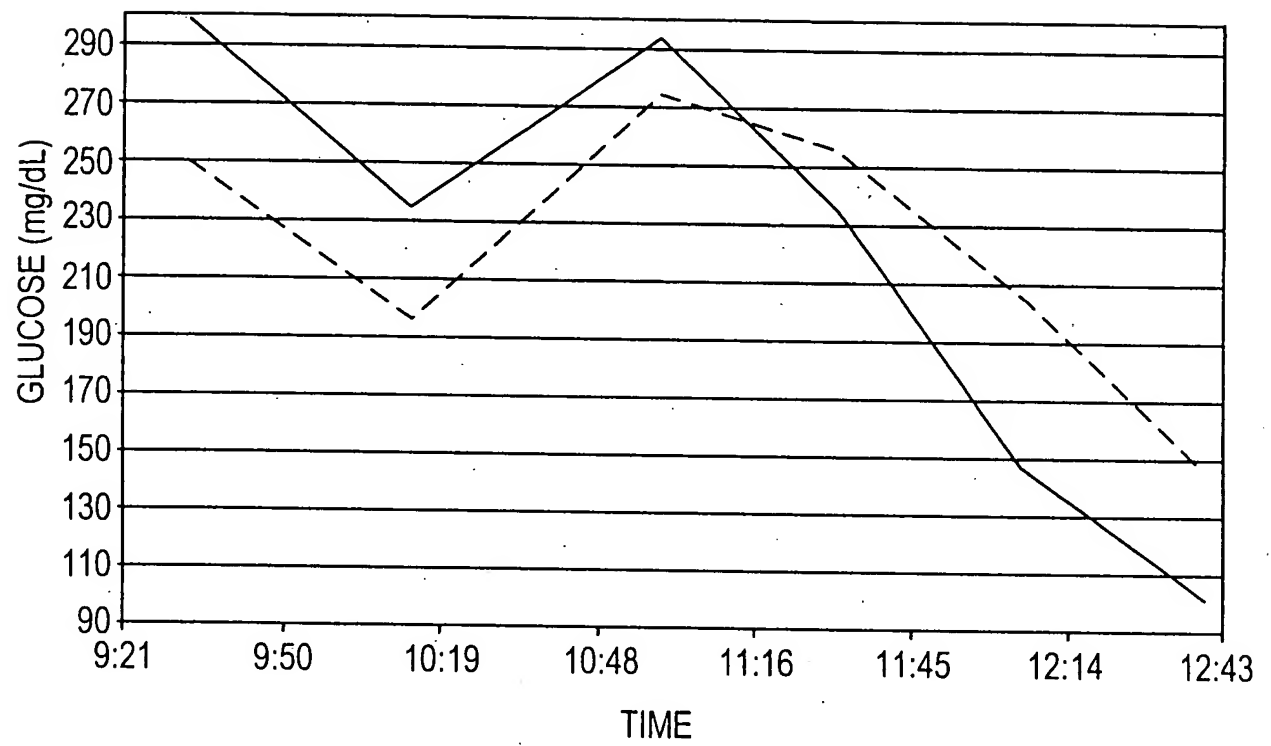


FIG. 17B



— ACTUAL  
--- PREDICTED

DIFFERENCE  
MIN = -132.4%  
MAX = 42.6%  
AVE = 46.6%

FIG. 17C

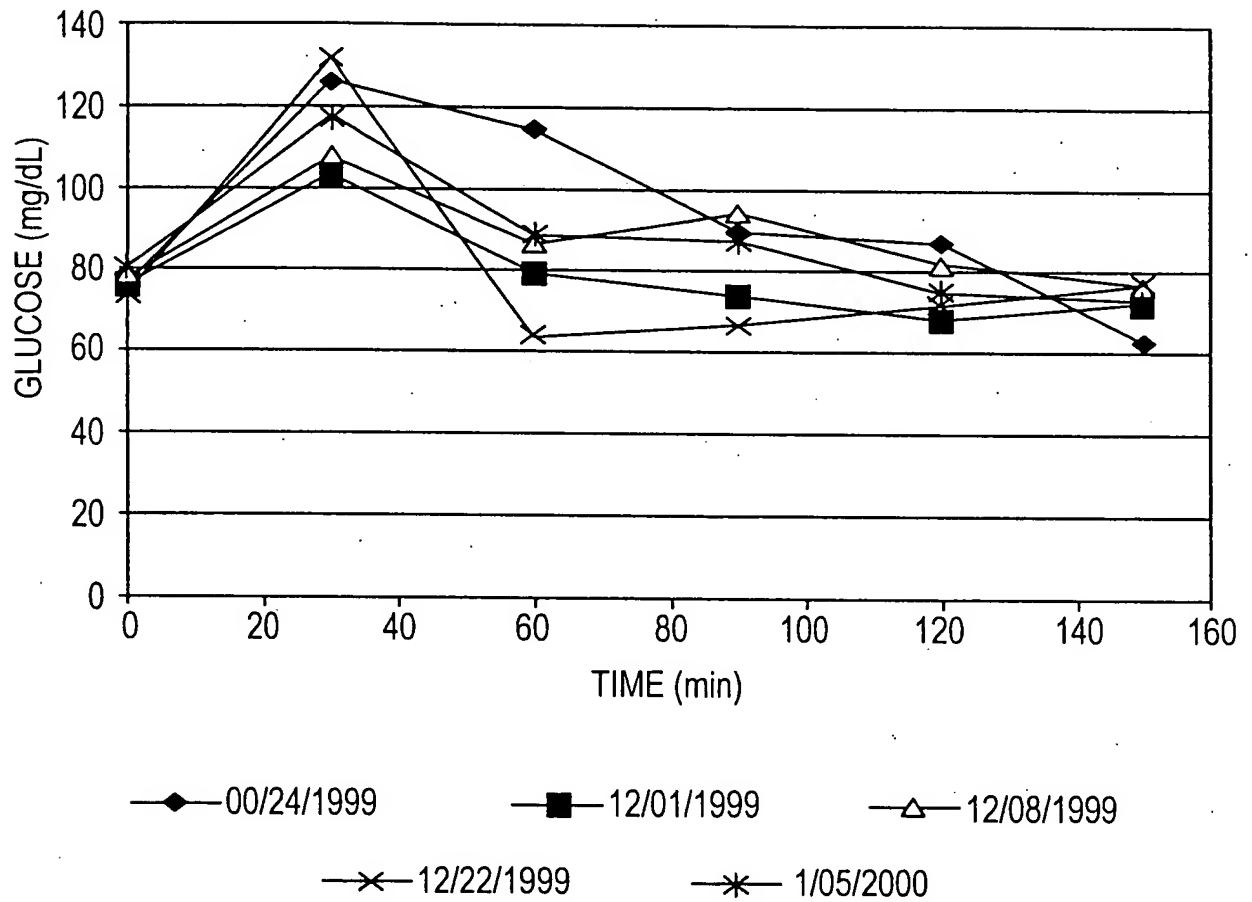


FIG. 18A

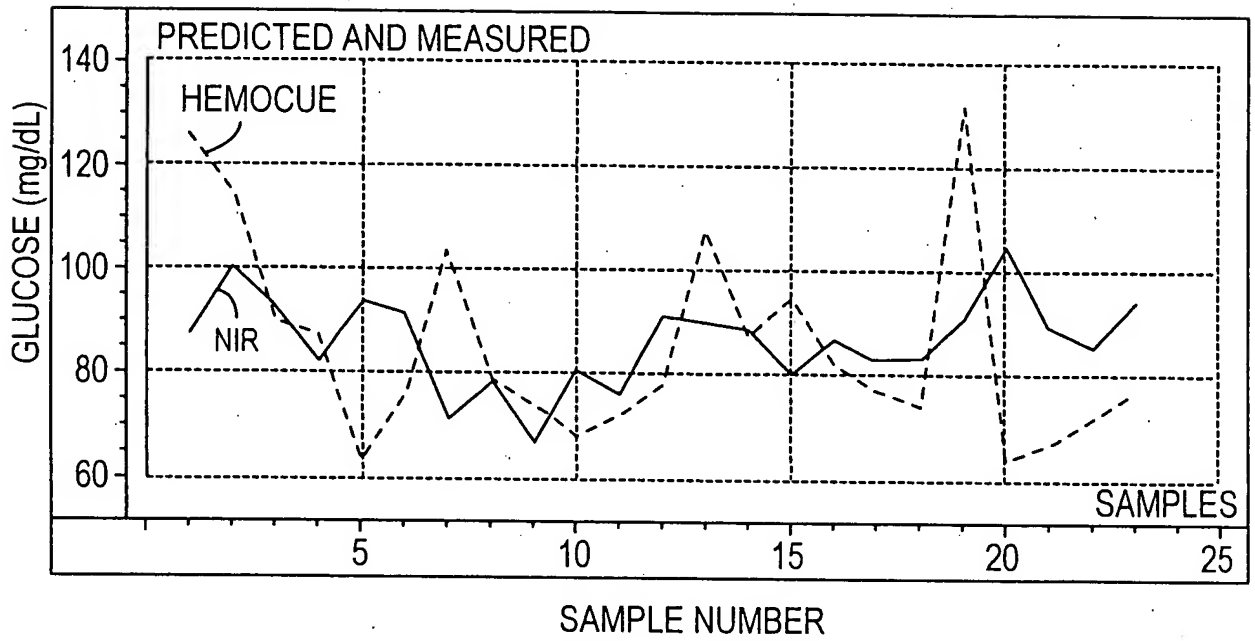


FIG. 18B

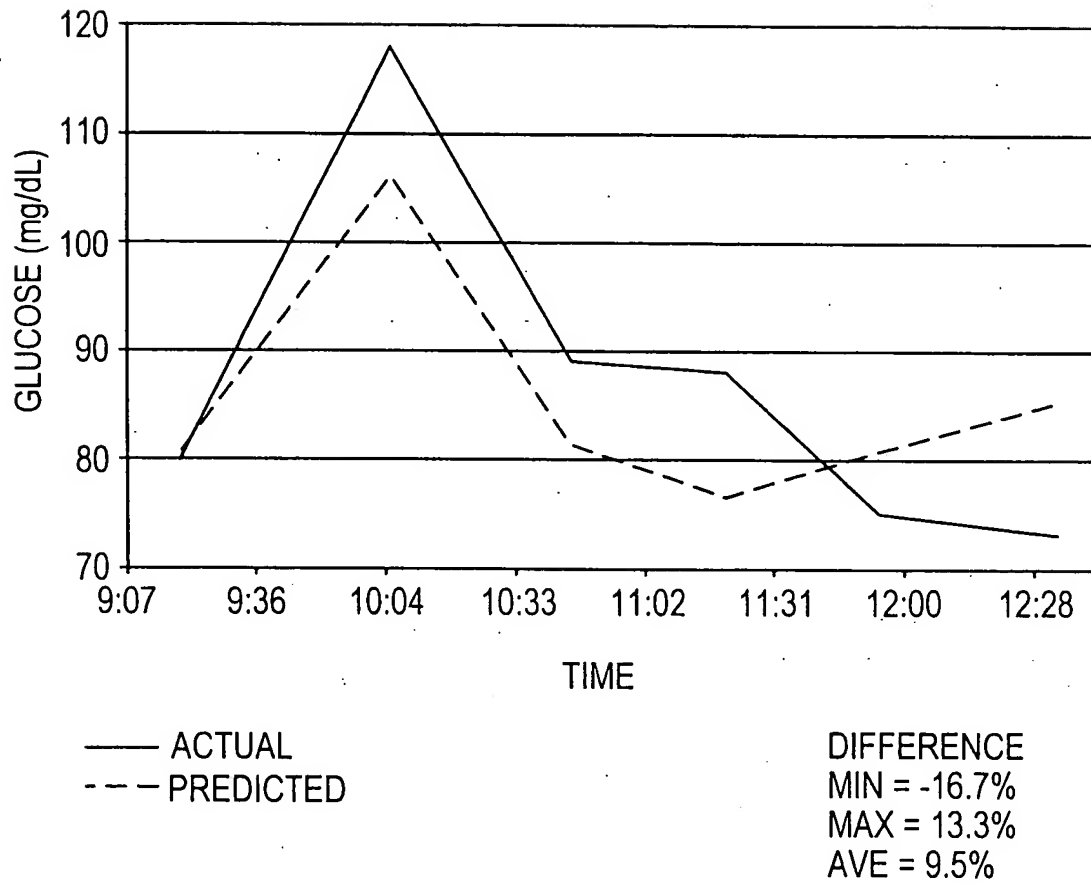


FIG. 18C



## DIFFUSE REFLECTANCE TRANSFORMS

## SECOND TRANSFORM:

1ST TRANSFORM	N U L L S	B A S E C O R R	N O R M A L I Z	F I R S T D R V	S E C O N D D R V	M U L T S C A T	K U B L M U N K	S M O O T H N G	R A T I O	M E A N C N T R	S G D E R I V 1	S G D E R I V 2	A B S 2 R E F L
------------------	-----------------------	--------------------------------------	--------------------------------------	--------------------------------------	---	--------------------------------------	--------------------------------------	--------------------------------------	-----------------------	--------------------------------------	--------------------------------------	--------------------------------------	--------------------------------------

NULLS	1	1	1	1	1	1	1	1	1	0	1	1	1
BASECORR	0	0	1	1	1	0	0	1	1	0	1	1	1
NORMALIZ	0	1	0	1	1	0	0	1	0	0	1	1	1
FIRSTDRV	0	0	1	0	0	0	0	1	0	0	0	0	0
SECNDDRV	0	0	1	0	0	0	0	1	0	0	0	0	0
MULTSCAT	0	0	0	1	1	0	1	1	0	0	1	1	1
KUBLMUNK	0	1	1	1	1	1	0	1	0	0	1	1	0
SMOOTHNG	0	1	1	1	1	1	1	0	0	0	1	1	1
RATIO	0	0	0	0	0	0	0	0	0	0	0	0	0
MEANCNTR	0	0	0	0	0	0	0	0	0	0	0	0	0
SGDERIV1	0	0	1	0	0	0	0	1	0	0	0	0	0
SGDERIV2	0	0	1	0	0	0	0	1	0	0	0	0	0
ABS2REFL	0	1	1	1	1	1	0	1	0	0	1	1	0

FIG. 19A

## DIFFUSE REFLECTANCE RATIOS

## DENOMINATOR TRANSFORM

NUMERATOR TRANSFORM	N U L L S	B A S E C O R R	N O R M A L I Z	F I R S T D R V	S E C N D D R V	M U L T S C A T	K U B L M U N K	S M O O T H N G	R A T I O	M E A N C N T R	S G D E R I V 1	S G D E R I V 2	A B S 2 R E F L
NULLS	1	1	0	0	0	0	0	0	0	0	0	0	0
BASECORR	0	1	0	0	0	0	0	0	0	0	0	0	0
NORMALIZ	0	1	1	0	0	0	0	0	0	0	0	0	0
FIRSTDRV	1	0	0	1	0	0	0	0	0	0	0	0	0
SECNDDRV	1	0	0	0	1	0	0	0	0	0	0	0	0
MULTSCAT	0	1	0	0	0	1	0	0	0	0	0	0	0
KUBLMUNK	0	1	0	0	0	0	1	0	0	0	0	0	0
SMOOTHNG	0	1	0	0	0	0	0	1	0	0	0	0	0
RATIO	0	0	0	0	0	0	0	0	0	0	0	0	0
MEANCNTR	0	0	0	0	0	0	0	0	0	0	1	0	0
SGDERIV1	1	0	0	0	0	0	0	0	0	0	0	1	0
SGDERIV2	1	0	0	0	0	0	0	0	0	0	0	0	1
ABS2REFL	0	1	0	0	0	0	0	0	0	0	0	0	1

FIG. 19B

## DIFFUSE TRANSMITTANCE TRANSFORMS

## SECOND TRANSFORM:

	N	B	N	F	S	M	K	S	R	M	S	S	A
	U	A	O	I	E	U	U	M	A	E	G	G	B
	L	S	R	R	C	L	B	O	T	A	D	D	S
	L	E	M	S	N	T	L	O	I	N	E	E	2
	S	C	A	T	D	S	M	T	O	C	R	R	R
		O	L	D	D	C	U	H		N	I	I	E
1ST		R	I	R	R	A	N	N		T	V	V	F
TRANSFORM		R	Z	V	V	T	K	G		R	1	2	L

NULLS	1	1	1	1	1	1	0	1	1	0	1	1	1
BASECORR	0	0	1	1	1	0	0	1	1	0	1	1	1
NORMALIZ	0	1	0	1	1	0	0	1	0	0	1	1	1
FIRSTDRV	0	0	1	0	0	0	0	1	0	0	0	0	0
SECNDDRV	0	0	1	0	0	0	0	1	0	0	0	0	0
MULTSCAT	0	0	0	1	1	0	0	1	0	0	1	1	1
KUBLMUNK	0	0	0	0	0	0	0	0	0	0	0	0	0
SMOOTHNG	0	1	1	1	1	1	0	0	0	0	1	1	1
RATIO	0	0	0	0	0	0	0	0	0	0	0	0	0
MEANCNTR	0	0	0	0	0	0	0	0	0	0	0	0	0
SGDERIV1	0	0	1	0	0	0	0	1	0	0	0	0	0
SGDERIV2	0	0	1	0	0	0	0	1	0	0	0	0	0
ABS2REFL	0	1	1	1	1	1	0	1	0	0	1	1	0

FIG. 20A

## DIFFUSE TRANSMITTANCE RATIOS

## DENOMINATOR TRANSFORM

NUMERATOR TRANSFORM	N	B	N	F	S	M	K	S	R	M	S	S	A
	U	A	O	I	E	U	U	M	A	E	G	G	B
	L	S	R	R	C	L	B	O	T	A	D	D	S
	S	E	M	S	N	T	L	O	I	N	E	E	2
		C	A	T	D	S	M	T	O	C	R	R	R
		O	L	D	D	C	U	H		N	I	I	E
		R	I	R	R	A	N	N		T	V	V	F
		R	Z	V	V	T	K	G		R	1	2	L

NULLS	1	1	0	0	0	0	0	0	0	0	0	0	0
BASECORR	0	1	0	0	0	0	0	0	0	0	0	0	0
NORMALIZ	0	1	1	0	0	0	0	0	0	0	0	0	0
FIRSTDRV	1	0	0	1	0	0	0	0	0	0	0	0	0
SECNDDRV	1	0	0	0	1	0	0	0	0	0	0	0	0
MULTSCAT	0	1	0	0	0	1	0	0	0	0	0	0	0
KUBLMUNK	0	0	0	0	0	0	0	0	0	0	0	0	0
SMOOTHNG	0	1	0	0	0	0	0	1	0	0	0	0	0
RATIO	0	0	0	0	0	0	0	0	0	0	0	0	0
MEANCNTR	0	0	0	0	0	0	0	0	0	0	0	0	0
SGDERIV1	1	0	0	0	0	0	0	0	0	0	1	0	0
SGDERIV2	1	0	0	0	0	0	0	0	0	0	0	1	0
ABS2REFL	0	1	0	0	0	0	0	0	0	0	0	0	1

FIG. 20B

## CLEAR TRANSMITTANCE TRANSFORMS

## SECOND TRANSFORM:

1ST TRANSFORM	N	B	N	F	S	M	K	S	R	M	S	S	A
	U	A	O	I	E	U	U	M	A	E	G	G	B
	L	S	R	R	C	L	B	O	T	A	D	D	S
	L	E	M	S	N	T	L	O	I	N	E	E	2
	S	C	A	T	D	S	M	T	O	C	R	R	R
		O	L	D	D	C	U	H		N	I	I	E
		R	I	R	R	A	N	N		T	V	V	F
		R	Z	V	V	T	K	G		R	1	2	L

NULLS	1	1	1	1	1	0	0	1	1	0	1	1	1
BASECORR	0	0	1	1	1	0	0	1	1	0	1	1	1
NORMALIZ	0	1	0	1	1	0	0	1	0	0	1	1	1
FIRSTDRV	0	0	1	0	0	0	0	1	0	0	0	0	0
SECNDDRV	0	0	1	0	0	0	0	1	0	0	0	0	0
MULTSCAT	0	0	0	0	0	0	0	0	0	0	0	0	0
KUBLMUNK	0	0	0	0	0	0	0	0	0	0	0	0	0
SMOOTHNG	0	1	1	1	1	0	0	0	0	0	1	1	1
RATIO	0	0	0	0	0	0	0	0	0	0	0	0	0
MEANCNTR	0	0	0	0	0	0	0	0	0	0	0	0	0
SGDERIV1	0	0	1	0	0	0	0	1	0	0	0	0	0
SGDERIV2	0	0	1	0	0	0	0	1	0	0	0	0	0
ABS2REFL	0	1	1	1	1	0	0	1	0	0	1	1	0

FIG. 21A

## CLEAR TRANSMITTANCE RATIOS

## DENOMINATOR TRANSFORM

	N	B	N	F	S	M	K	S	R	M	S	S	A
	U	A	O	I	E	U	U	M	A	E	G	G	B
	L	S	R	R	C	L	B	O	T	A	D	D	S
	L	E	M	S	N	T	L	O	I	N	E	E	2
	S	C	A	T	D	S	M	T	O	C	R	R	R
		O	L	D	D	C	U	H		N	I	I	E
NUMERATOR		R	I	R	R	A	N	N		T	V	V	F
TRANSFORM		R	Z	V	V	T	K	G		R	1	2	L

NULLS	1	1	0	0	0	0	0	0	0	0	0	0	0
BASECORR	0	1	0	0	0	0	0	0	0	0	0	0	0
NORMALIZ	0	1	1	0	0	0	0	0	0	0	0	0	0
FIRSTDRV	1	0	0	1	0	0	0	0	0	0	0	0	0
SECNDDRV	1	0	0	0	1	0	0	0	0	0	0	0	0
MULTSCAT	0	0	0	0	0	0	0	0	0	0	0	0	0
KUBLMUNK	0	0	0	0	0	0	0	0	0	0	0	0	0
SMOOTHNG	0	1	0	0	0	0	0	1	0	0	0	0	0
RATIO	0	0	0	0	0	0	0	0	0	0	0	0	0
MEANCNTR	0	0	0	0	0	0	0	0	0	0	0	0	0
SGDERIV1	1	0	0	0	0	0	0	0	0	0	1	0	0
SGDERIV2	1	0	0	0	0	0	0	0	0	0	0	1	0
ABS2REFL	0	1	0	0	0	0	0	0	0	0	0	0	1

FIG. 21B

DERIVATIVE SPACING:

SPACING = INT ( $n^{1.4}$ ),  $n = 1 : 10$

= 1, 2, 4, 6, 9, 12, 15, 18, 21, 25

*FIG. 22*

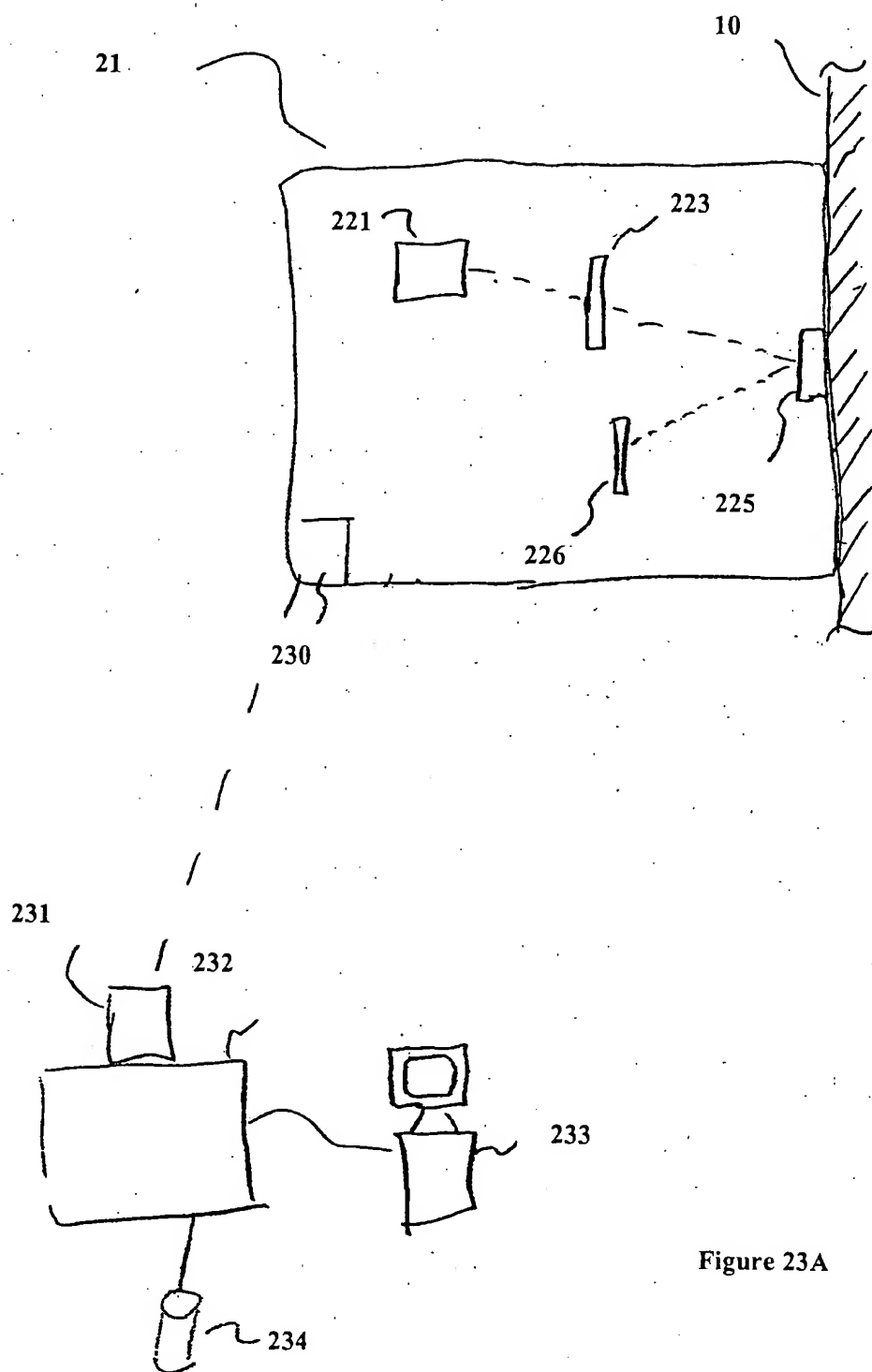


Figure 23A



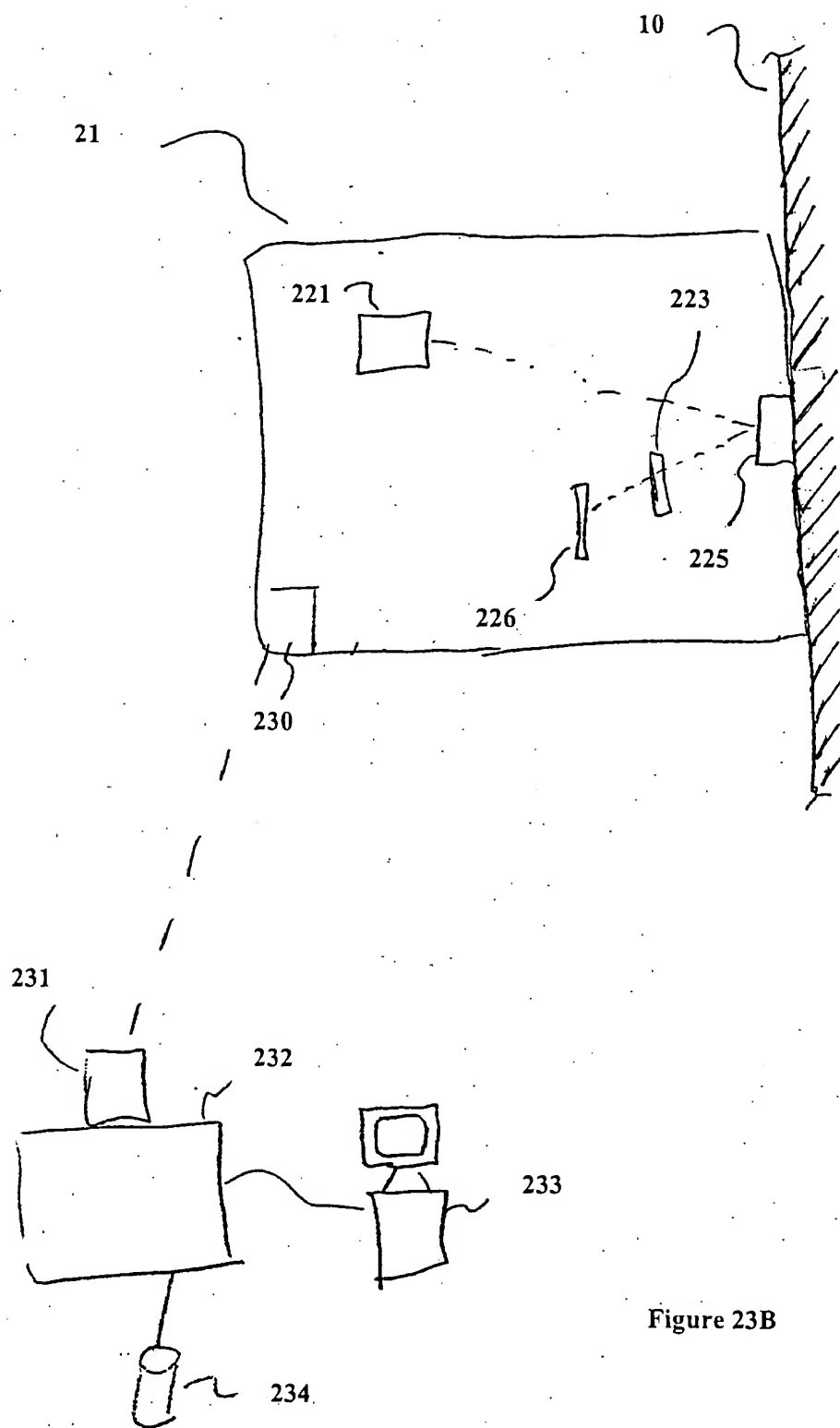


Figure 23B

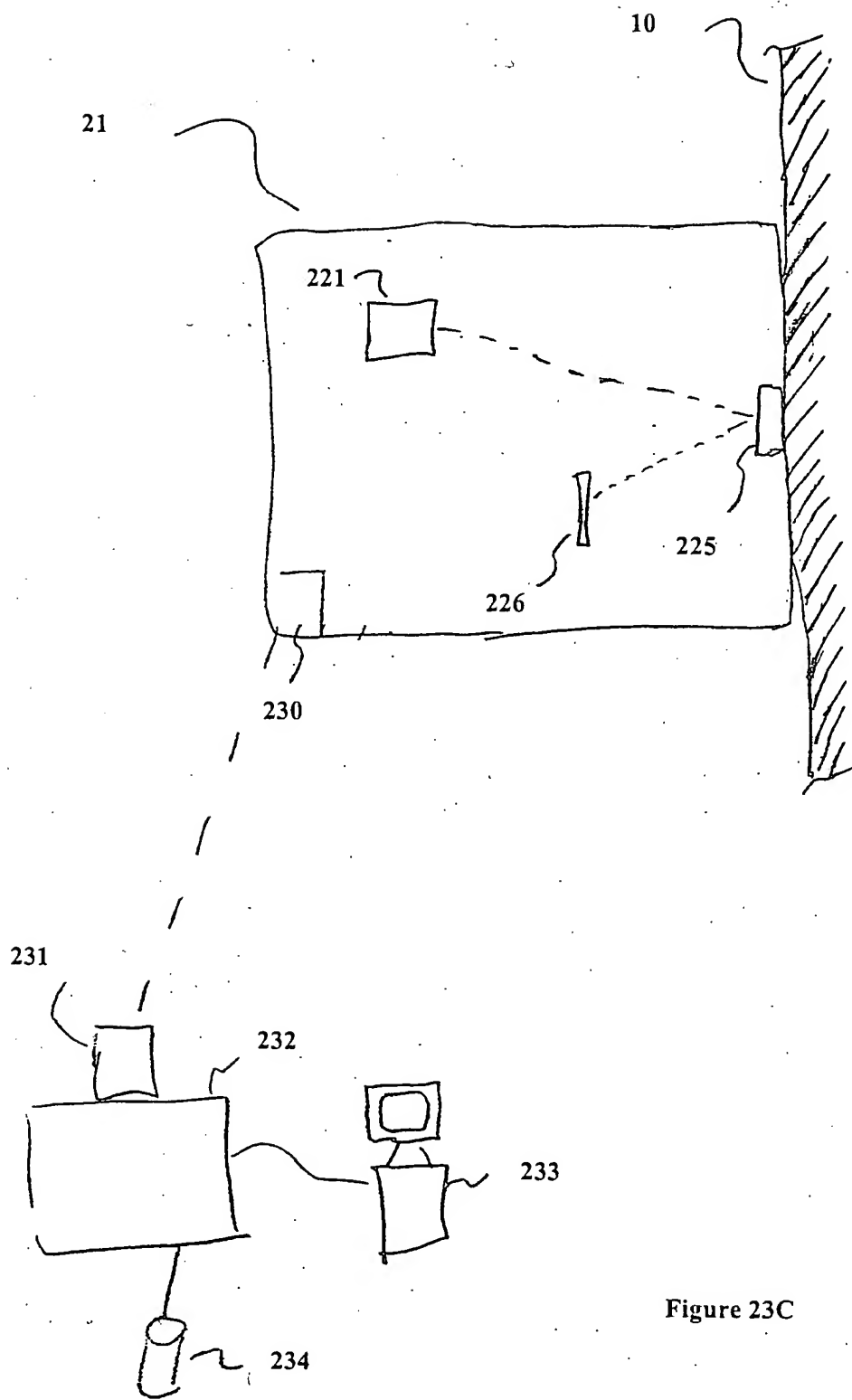


Figure 23C

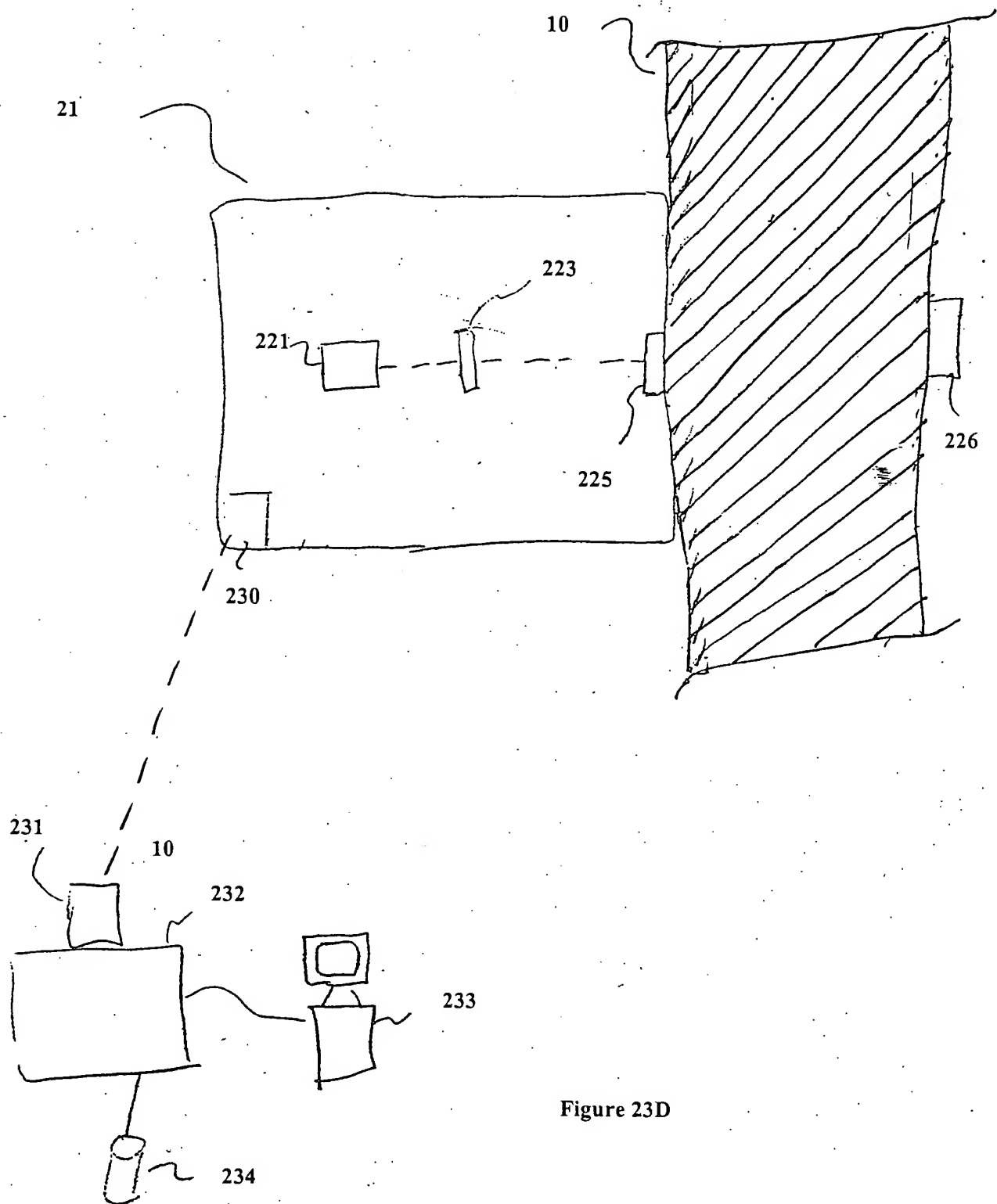


Figure 23D

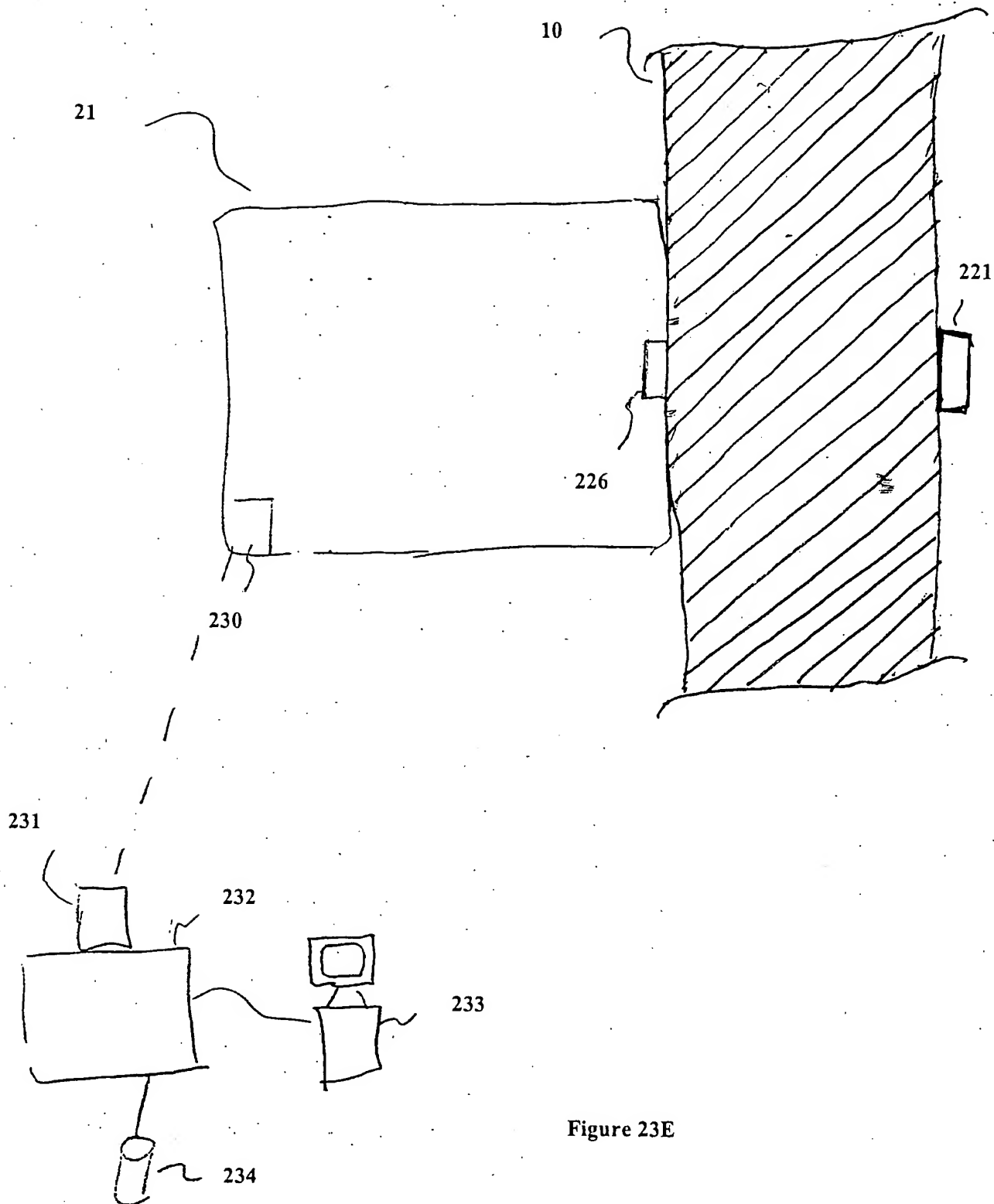


Figure 23E

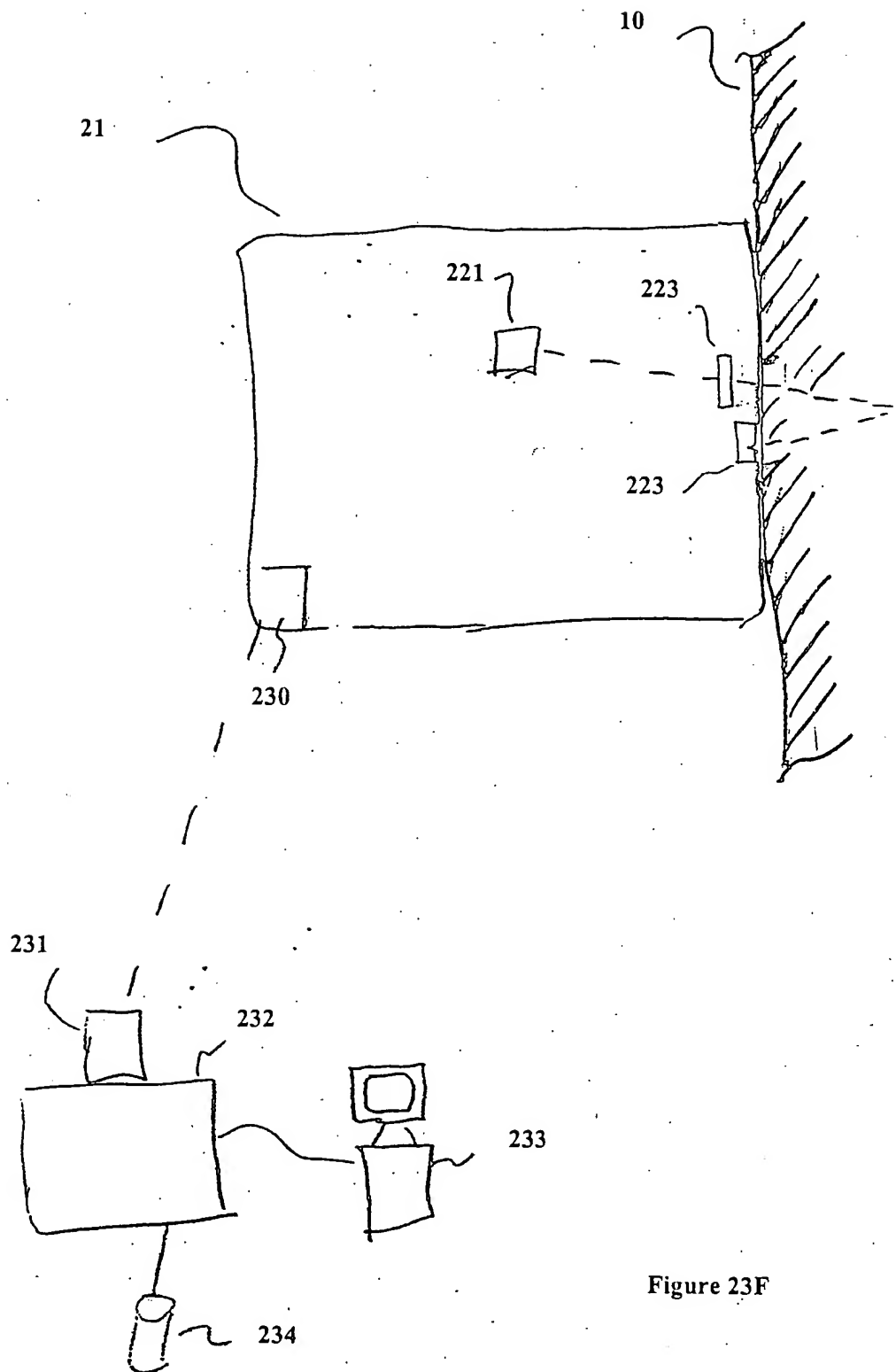
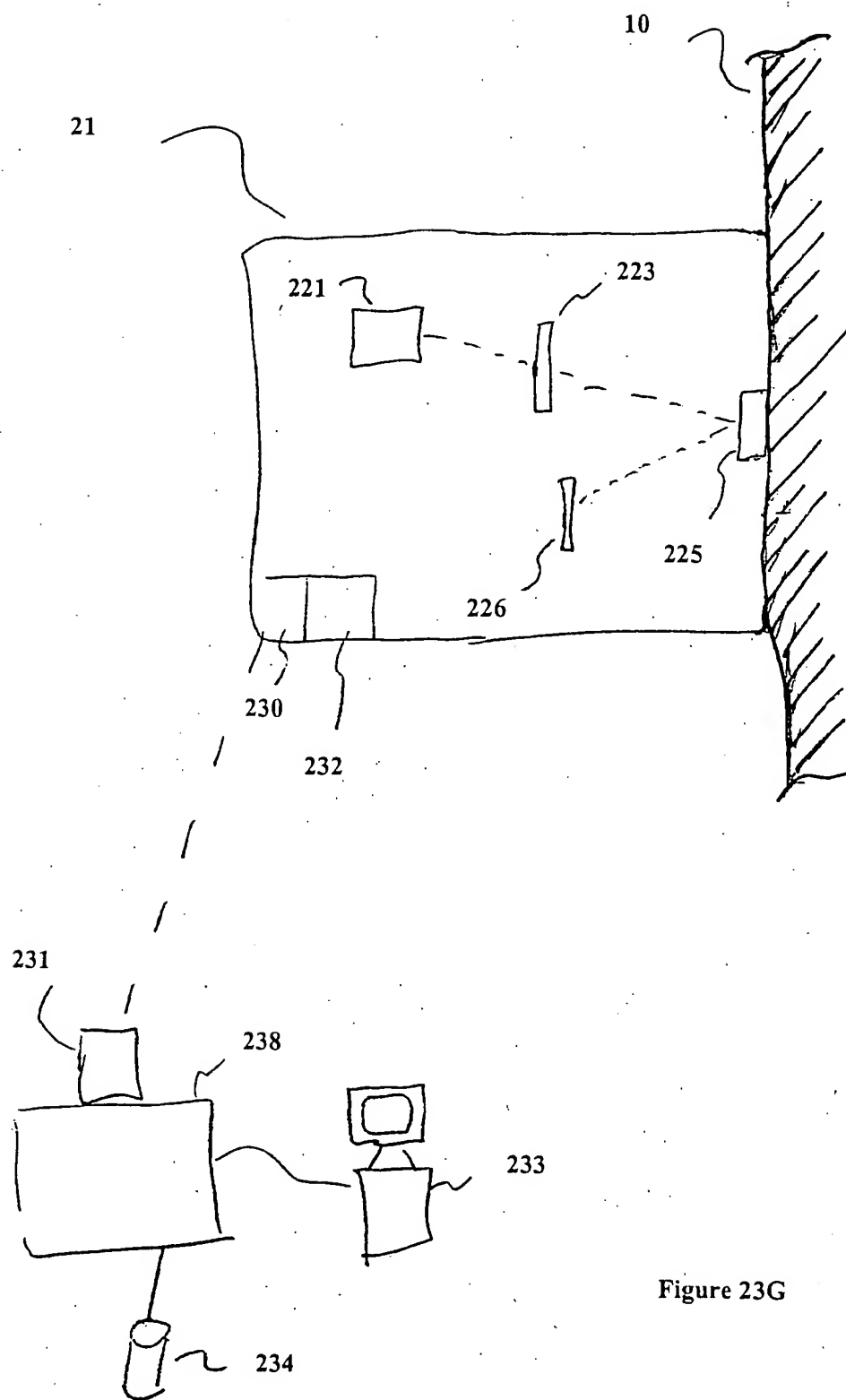


Figure 23F



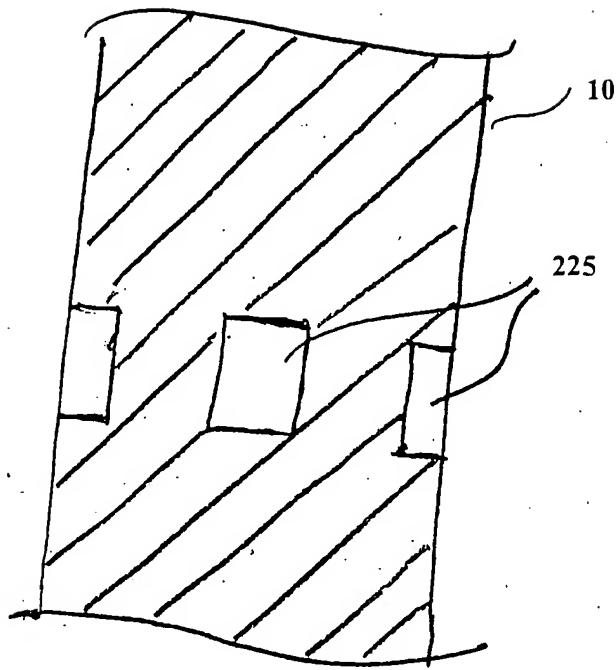


Figure 24

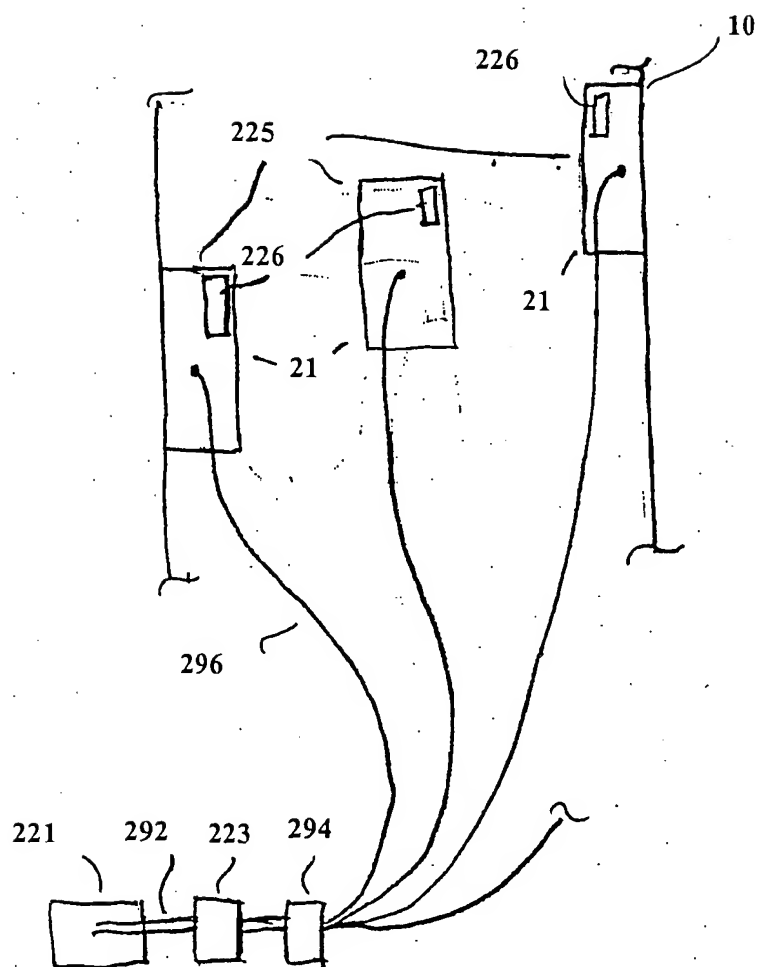
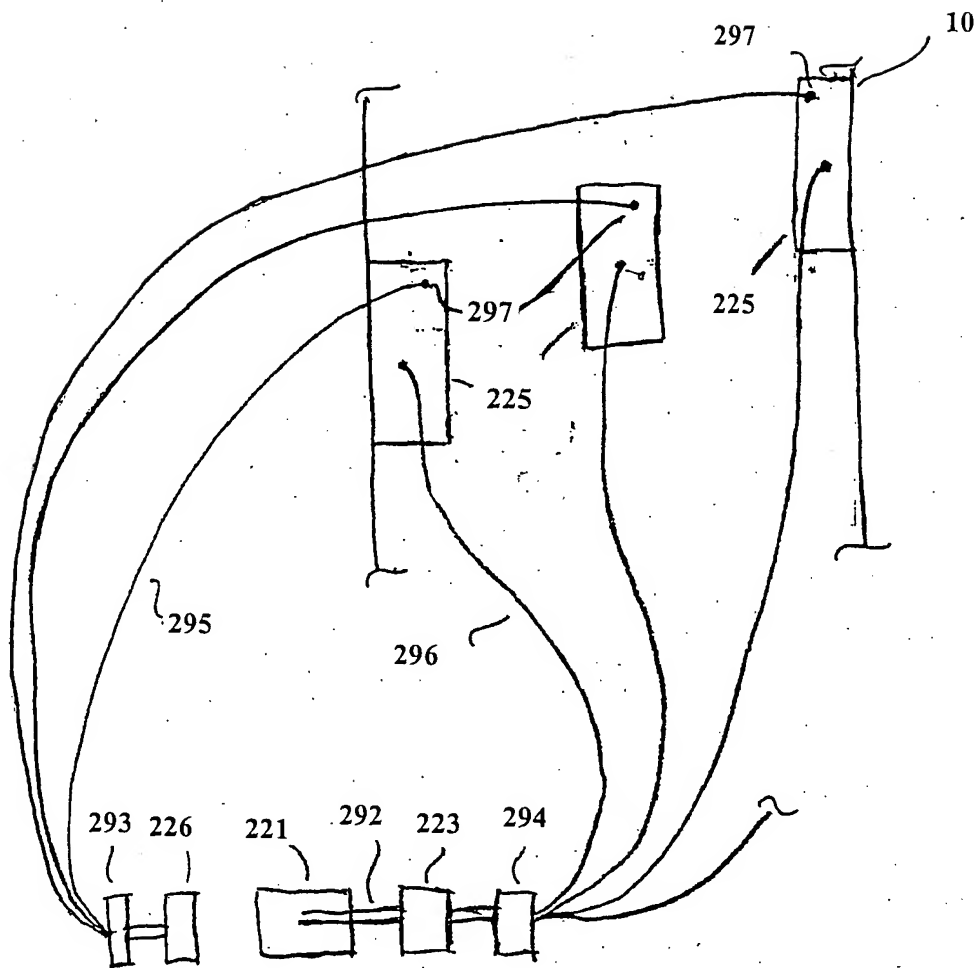


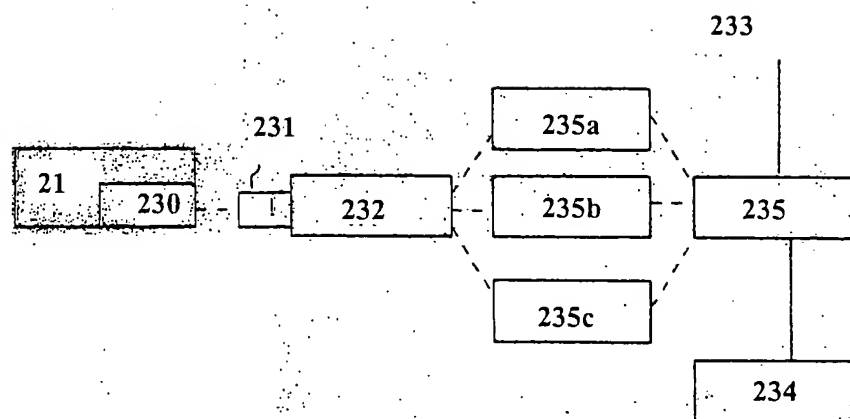
Figure 25



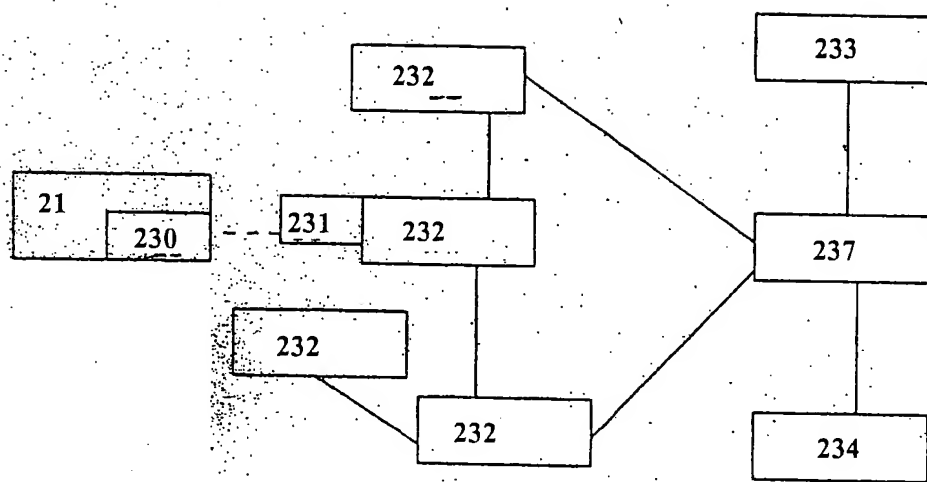


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Figure 26



**Figure 27**



**Figure 28**

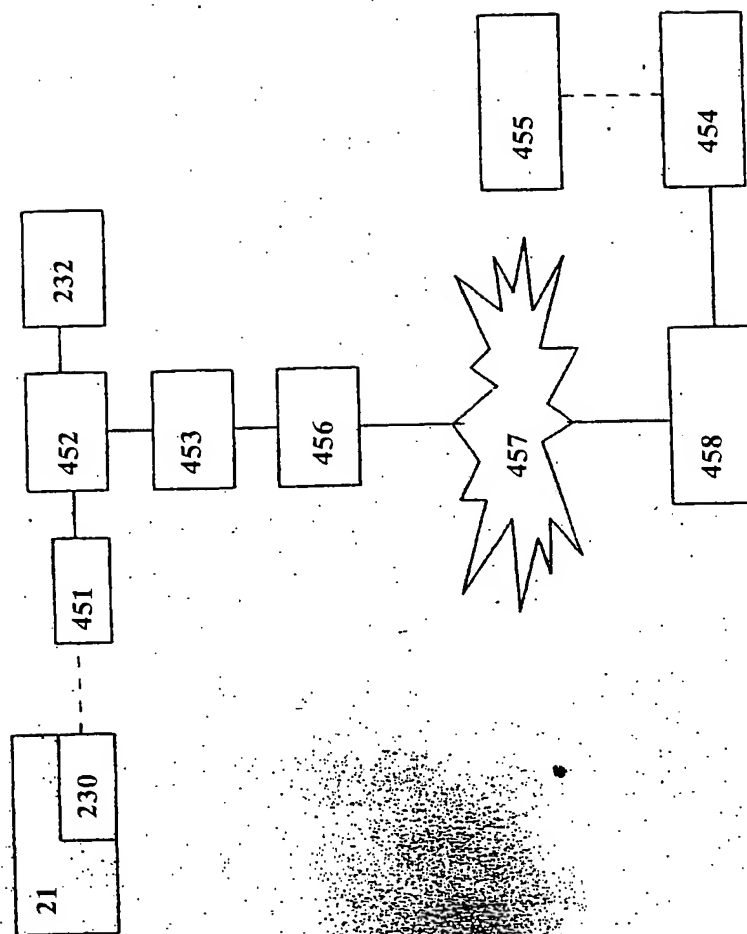


Figure 29

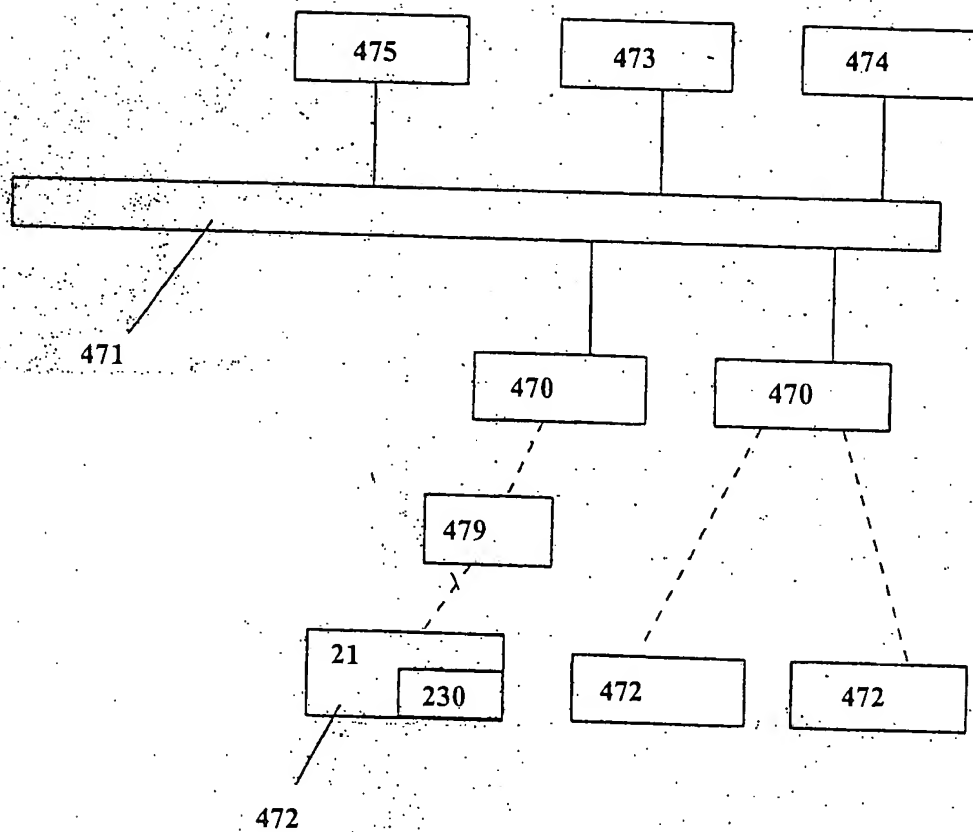


Figure 30

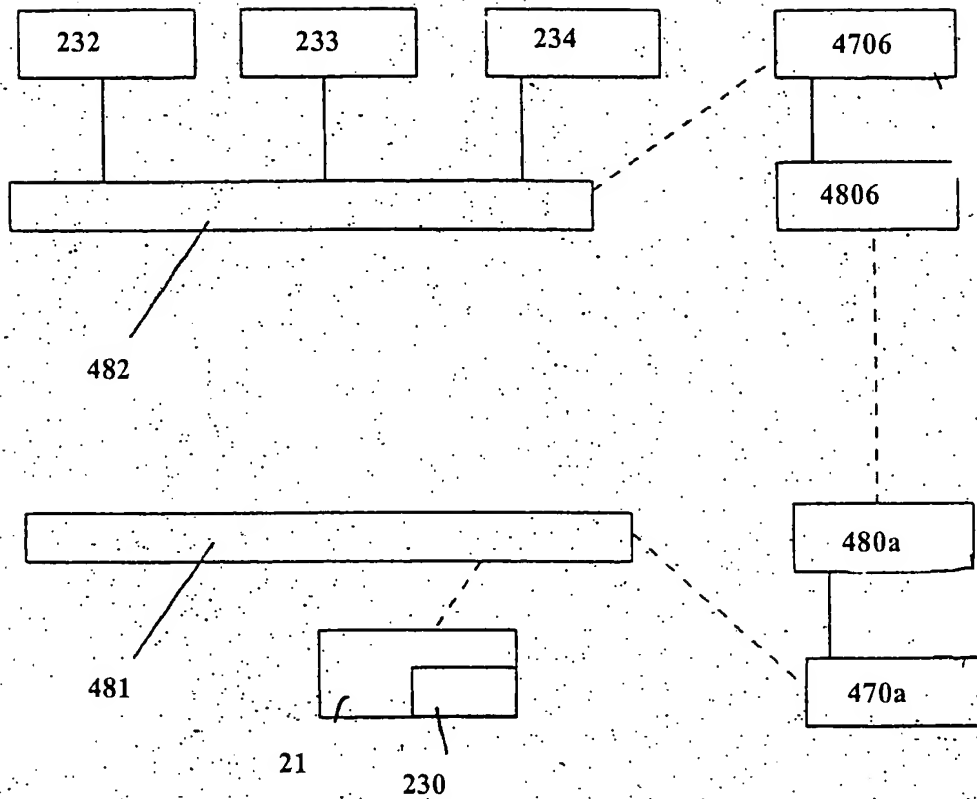
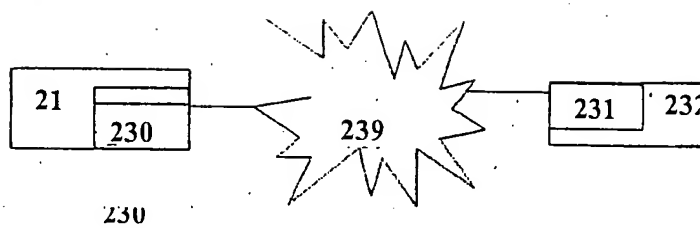
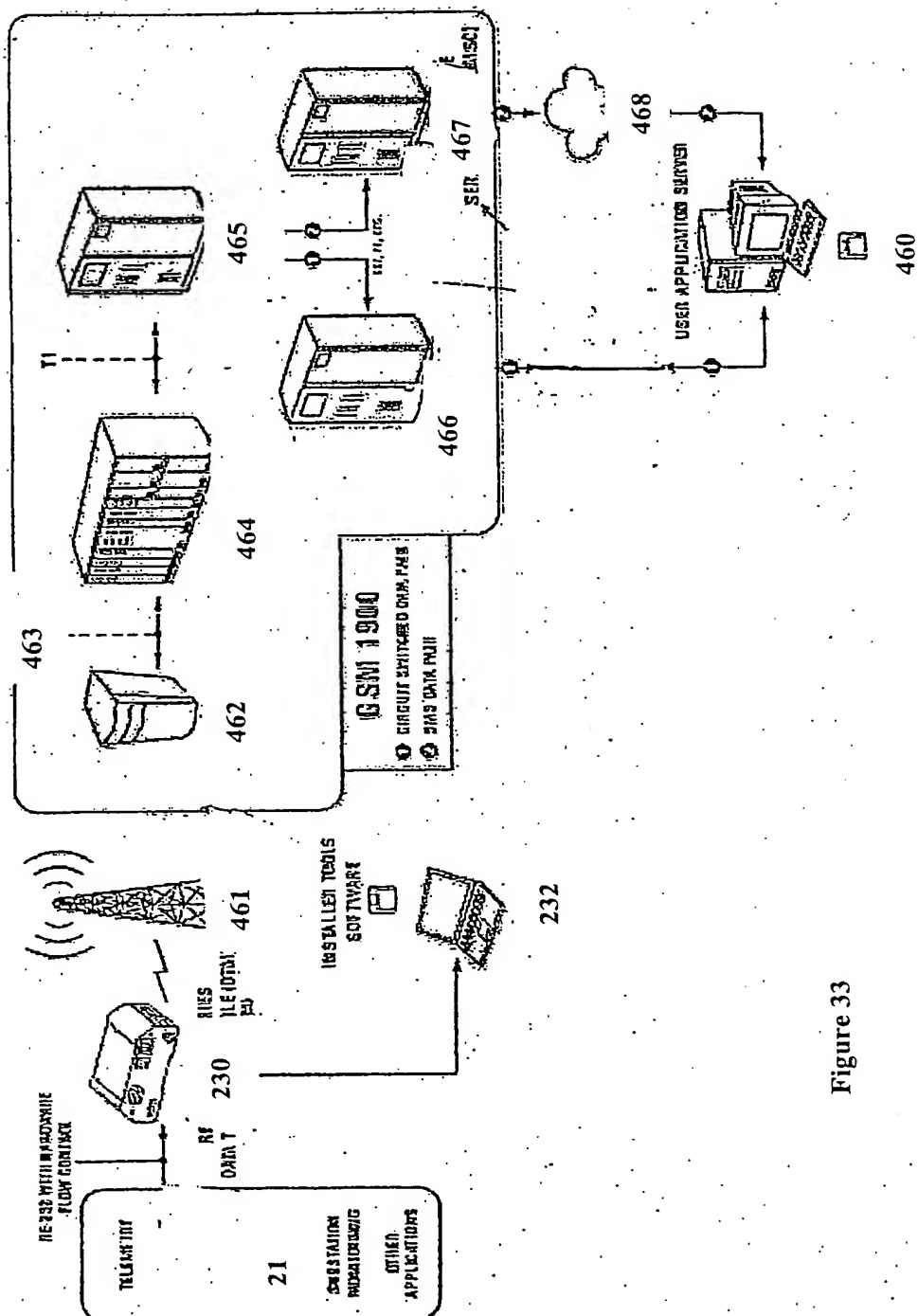


Figure 31



**Figure 32**





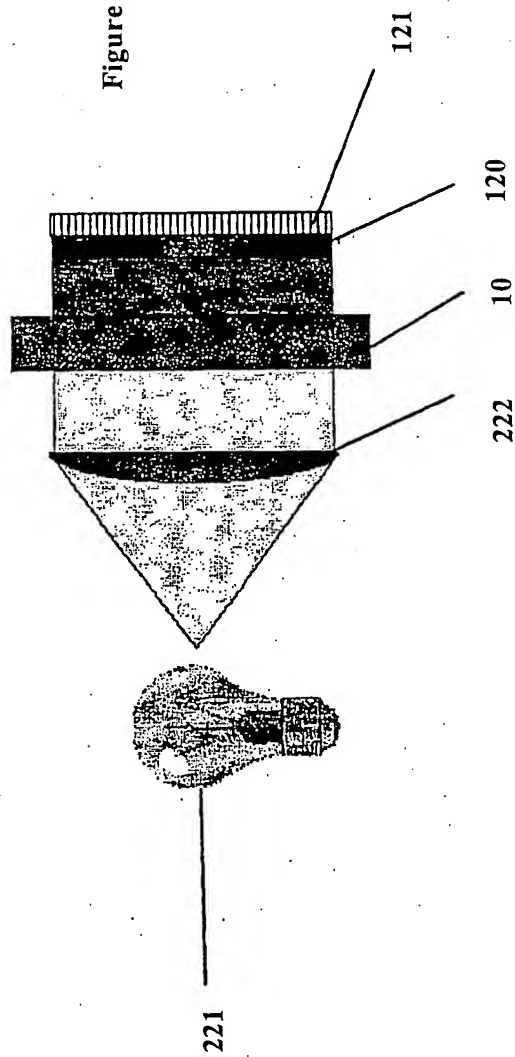


Figure 34A

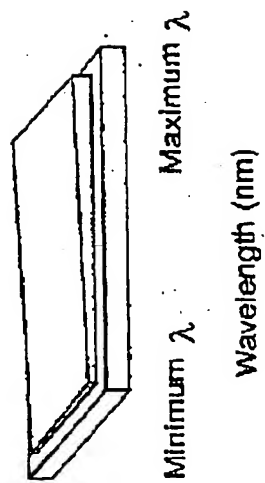


Figure 34B

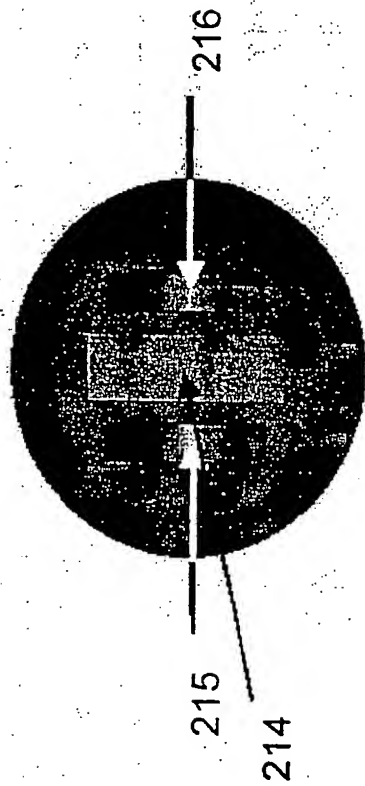


Fig. 35A

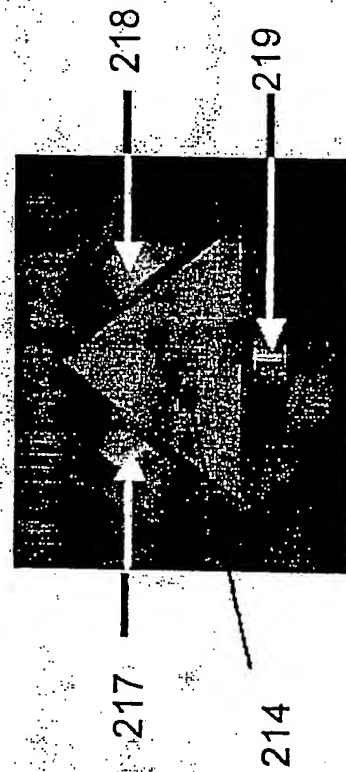


Fig. 35B

Figure 36

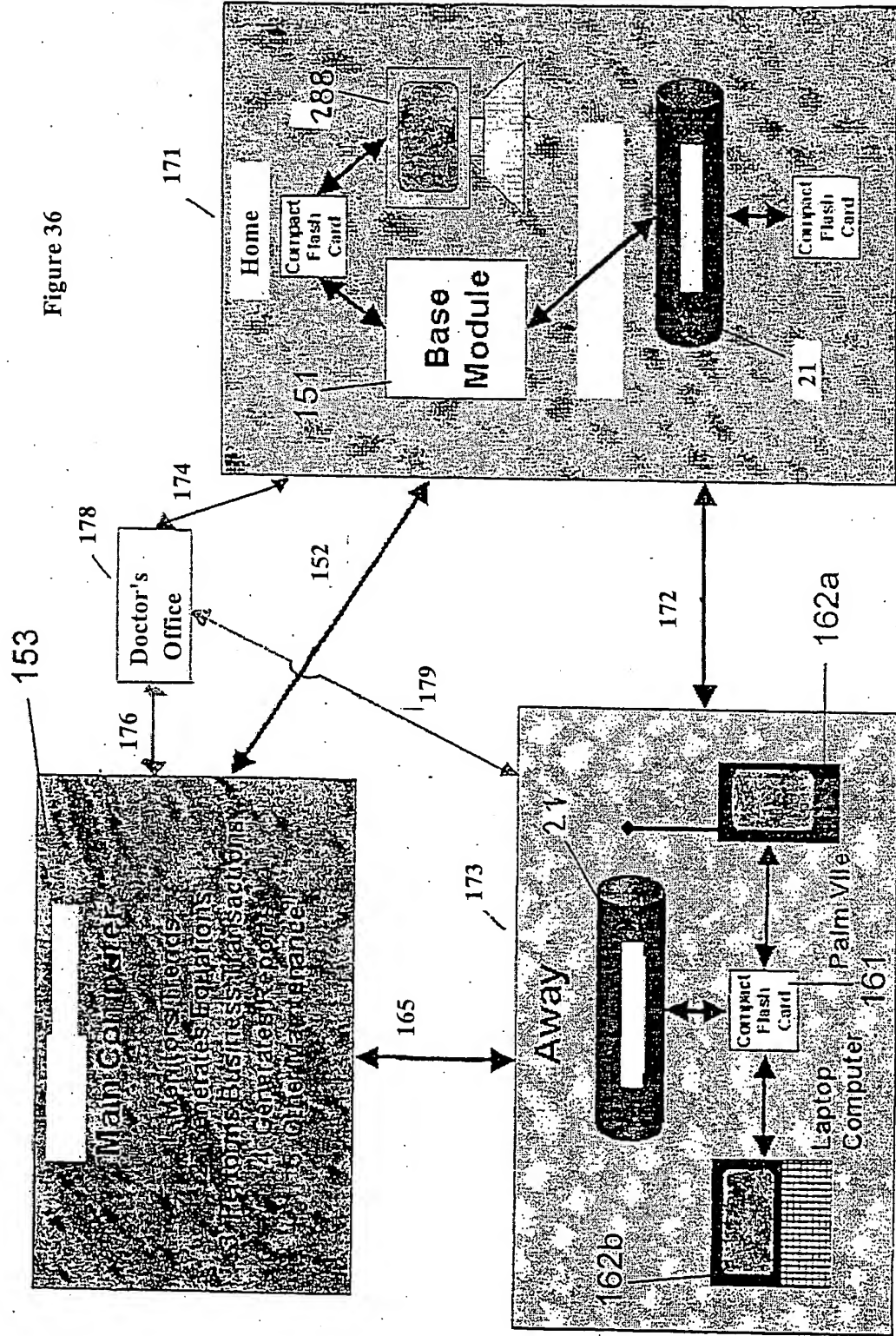
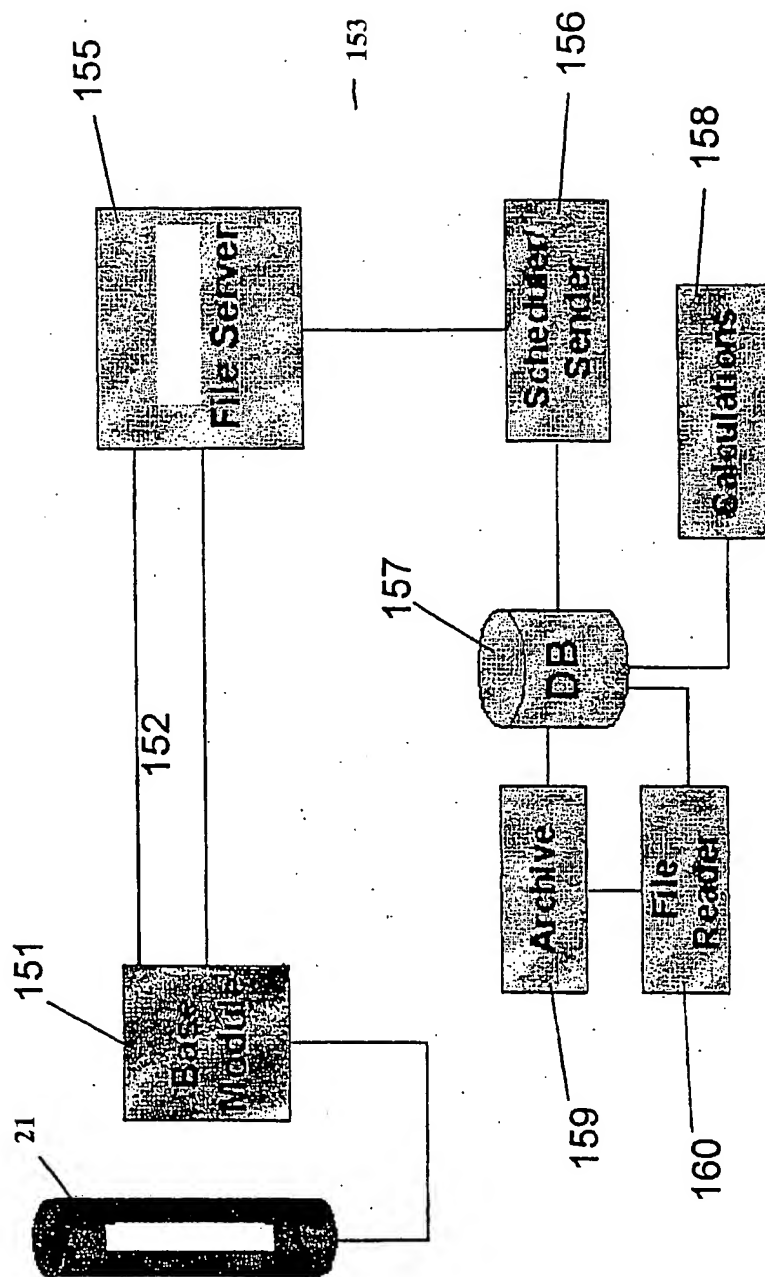


Figure 37



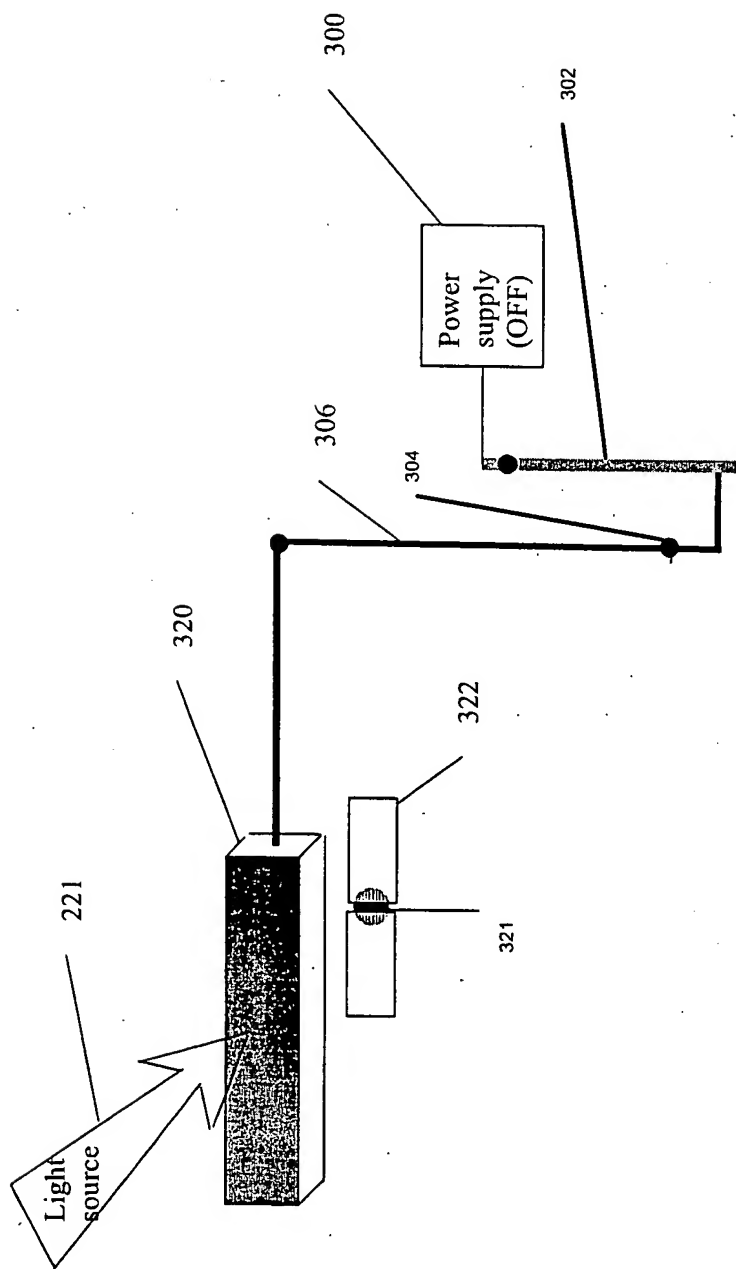


Figure 38a

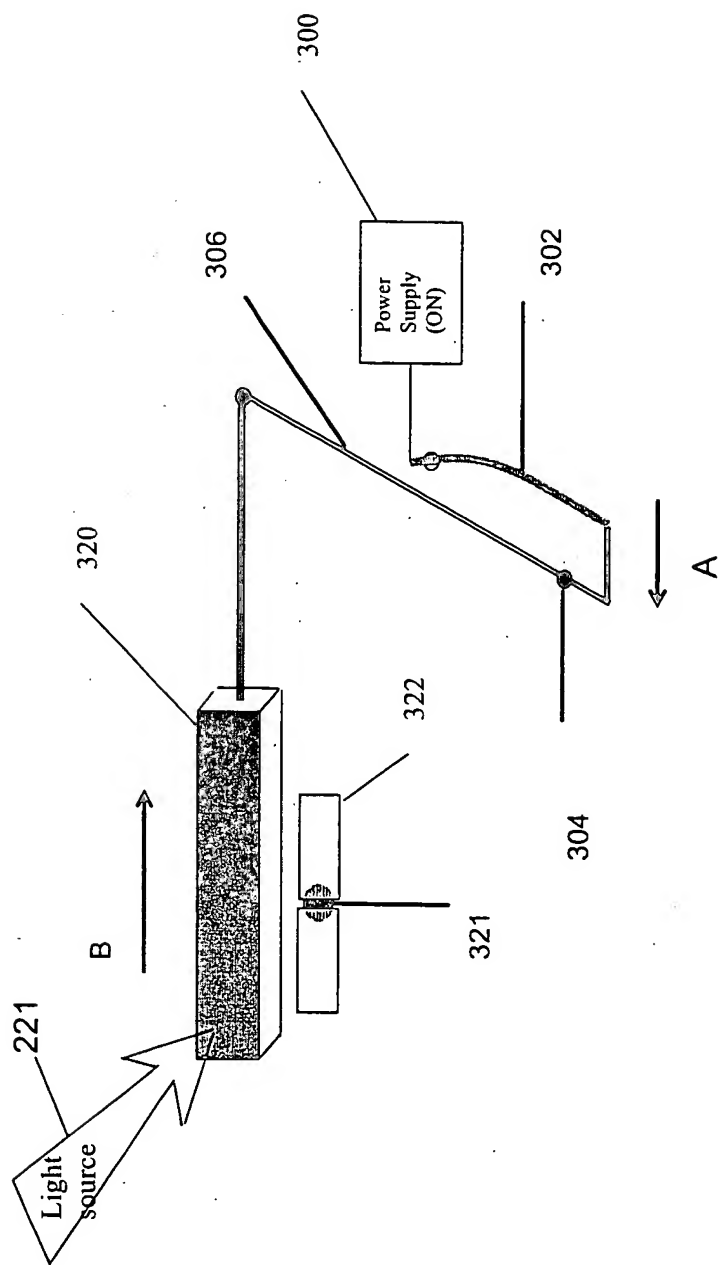


Figure 38B

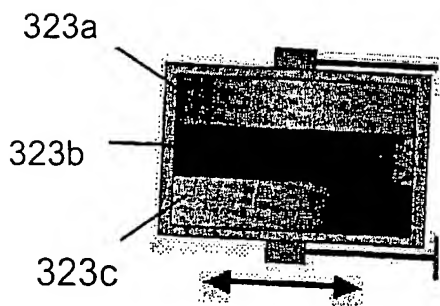


Figure 39A

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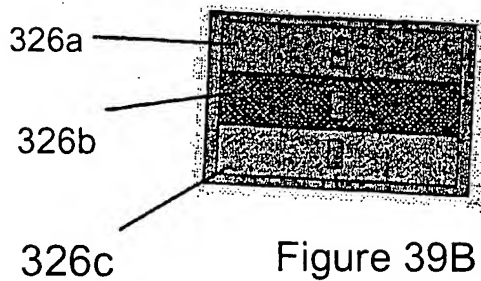


Figure 39B

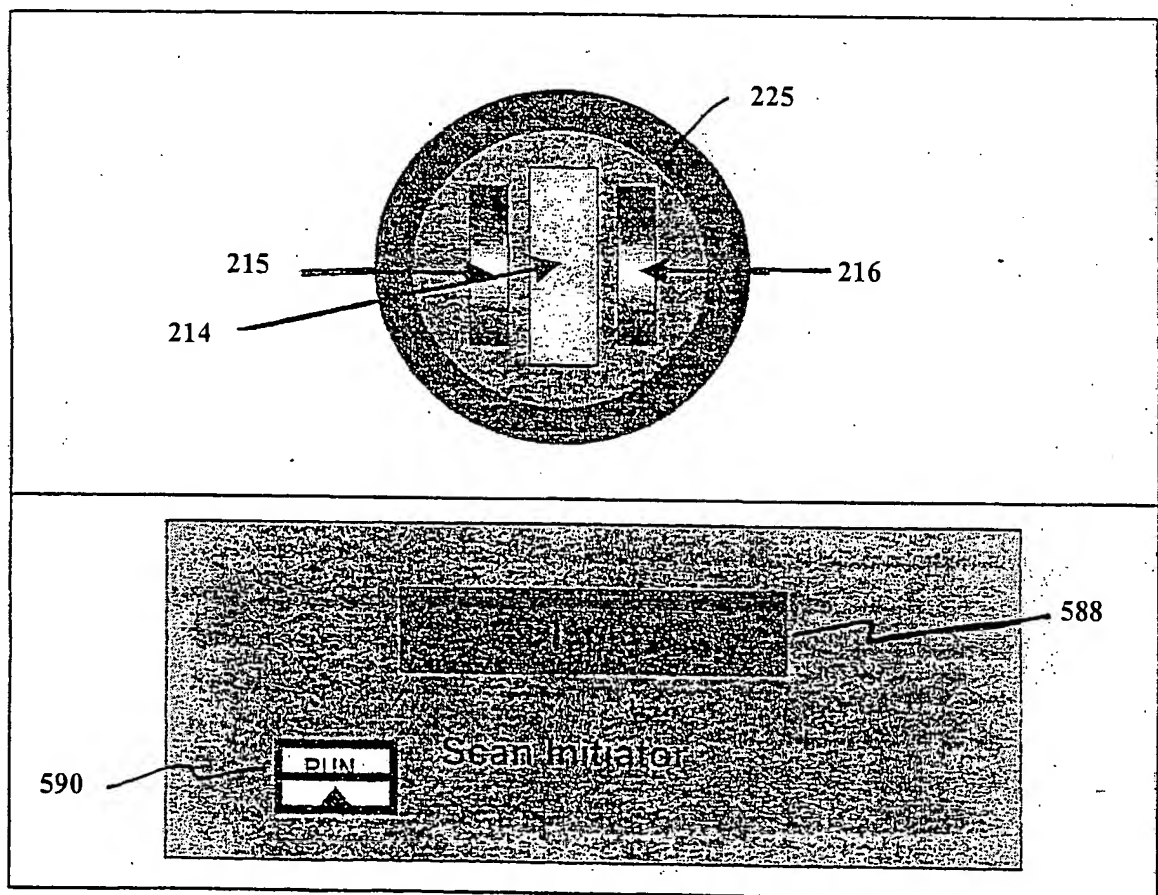
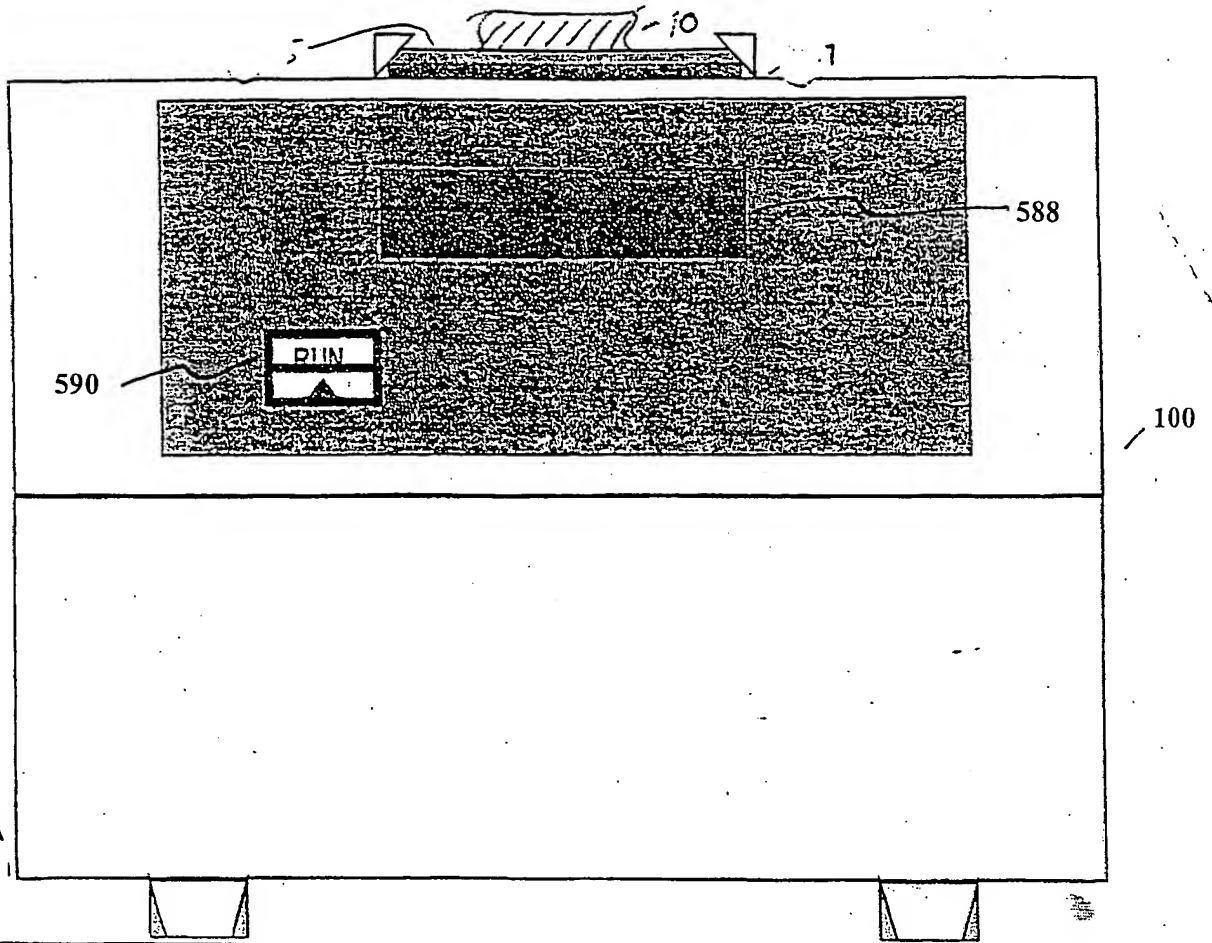




Fig. 40C

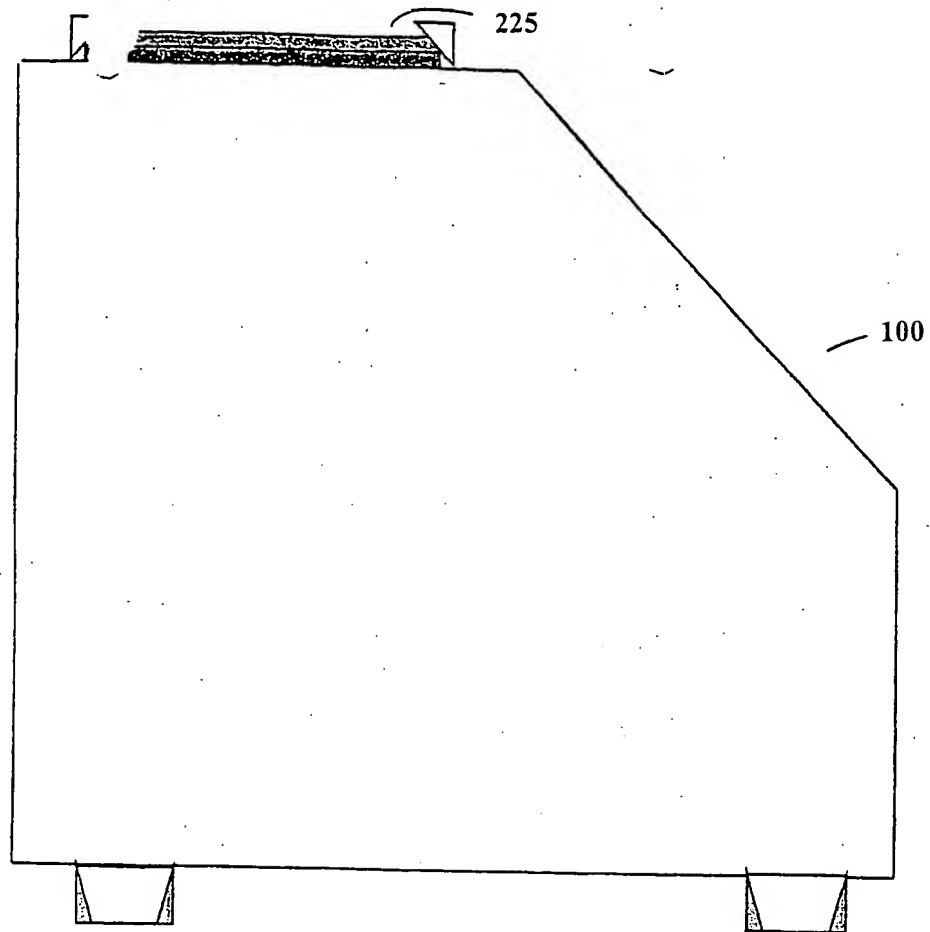


Fig. 40D

